Vermont Tech

Catalog 2017-2018

Master of Science
Computer Software Engineering

Bachelor of Science
Applied Business Management
Architectural Engineering Technology
Business Technology & Management
Computer Engineering Technology
Computer Information Technology
Computer Software Engineering
Construction Management
Dental Hygiene
Diversified Agriculture
Electrical Engineering Technology
Electromechanical Engineering Technology
Entrepreneurship
Manufacturing Engineering Technology
Nursing
Professional Pilot Technology
Renewable Energy

Associate of Applied Science
Agribusiness Management Technology
Architectural & Building Engineering Technology
Automotive Technology
Business Technology & Management
Construction Management
Dairy Farm Management Technology
Diesel Power Technology
Entrepreneurship
Equine Studies
Fire Science
General Engineering Technology
Landscape Design & Sustainable Horticulture
Veterinary Technology

Associate of Engineering
Civil & Environmental Engineering Technology
Computer Engineering Technology
Electrical Engineering Technology
Mechanical Engineering Technology

Associate of Science
Computer Information Technology
Computer Software Engineering
Nursing
Respiratory Therapy

Advanced Certificate
Advanced Software Development
Computer Networking
Cybersecurity
Software Development
Web Development

Certificate
Dairy Production & Processing
Diesel Technology
Forestry
Paramedicine
Practical Nursing

High School Diploma (VAST)

Foreword

This catalog is prepared to give the Vermont Tech community a comprehensive preview of programs and policies.

Notice of College Regulations

The information contained in this catalog is current at the time of publication and subject to change at any time. The regulations included in this catalog and other official college statements are binding on all students. The college reserves the right to change any of the regulations or curriculum at any time. Students have had sufficient notice of all official regulations when such are contained in official publications or posted on the college's website www.vtc.edu.

Should you have questions not answered in this catalog, please email admissions@vtc.edu or write to:

Office of Admissions
Vermont Technical College
PO Box 500
Randolph Center, VT 05061-0500

Vermont Tech:	(802) 728-1000
Office of Admissions:	(800) 442-8821 or (802) 728-1444
Fax:	(802) 728-1390

Non-Discrimination & Equal Opportunity Statement

Every member of Vermont Tech should work to ensure non-discriminatory processes and practices with faculty, staff, and students. Qualified students are recruited for, admitted to, and participate in all college programs without discrimination on the basis of race, color, sex, sexual orientation, religion, creed, national origin, age, veteran status, or disability. Vermont Tech will provide reasonable accommodations to create equal opportunities for students with documented disabilities.

Faculty, administrators, and staff are employed without discrimination on the basis of race, color, sex, sexual orientation, religion, creed, national origin, age, veteran status, or disability unrelated to job requirements. Vermont Tech will make reasonable accommodations to the known disability of an otherwise qualified applicant or employee.

Additionally, the Vermont State Colleges will engage in affirmative efforts to recruit, admit, and support students and to recruit, employ, and support employees in order to achieve the diversity which advances the educational mission.

The Vermont State Colleges complies with state and federal laws related to equal opportunity and non-discrimination. Any questions or complaints about potential or perceived discrimination in violation of any state or federal law should be directed to: the Vermont Tech Ombudsperson, the VSC Office of the Chancellor, the Vermont Office of the Attorney General, or the federal Equal Opportunity Employment Commission.

If auxiliary aid or service is needed to apply for admission or employment, please contact Vermont Tech's Learning Skills Specialist at (802) 728-1396. For questions related to Title IX, please contact the Title IX coordinator via mail at PO Box 500, Randolph Center, Vermont 05061.

Academic Calendar 2017-2018

2017 Fall Term

Sunday	**August 20**	Academic Day: student advising/department meetings
Monday	**August 21**	Classes begin for all students on all campuses
Friday	**September 1**	Add/drop period ends
Monday	**September 4**	Labor Day: no classes
Monday	**September 18**	Early warnings due
Friday	**October 6**	Deadline for make-up of *I* grade from spring or summer Fall graduation applications due Vacation begins after classes
Monday	**October 16**	Classes resume
Saturday	**October 28**	Last day to drop with a *W* (60% point)
Monday	**October 30**	Student faculty evaluation period begins
Thursday	**November 9**	Registration for spring begins
Friday	**November 17**	Thanksgiving recess begins after classes
Monday	**November 27**	Classes resume
Monday	**December 11**	Last day of classes for term Student faculty evaluation period ends
Tuesday	**December 12**	Final exams and presentations week begins
Saturday	**December 16**	Final exams and presentations week ends
Monday	**December 18**	Final grades due
Wednesday	**December 20**	Final grades posted

2018 Spring Term

Monday	**January 15**	Classes begin
Friday	**January 26**	Add/drop period ends
Monday	**February 12**	Early warnings due
Friday	**February 16**	Vacation begins after classes
Monday	**February 26**	Classes resume
Friday	**March 9**	Deadline for make-up of *I* grade from fall Spring graduation applications due
Friday	**March 23**	Last day to drop with a *W* (60% point)
Monday	**March 26**	Student faculty evaluation period begins
Friday	**March 30**	Vacation begins after classes
Monday	**April 9**	Classes resume Registration for summer and fall begins
Friday	**May 4**	Last day of classes Student faculty evaluation period ends
Monday	**May 7**	Final exams and presentations week begins
Friday	**May 11**	Final exams and presentations week ends

Sunday	**May 13**	Final grades due
Tuesday	**May 15**	Final grades posted
Friday	**May 18**	Commencement
Saturday	**May 19**	Allied Health Commencement
Tuesday	**May 22**	VAST graduation

PN Academic Calendar 2017-2018

2017 Fall Term

Monday	**August 21**	Classes begin for all students on all campuses
Friday	**September 1**	Add/drop period ends
Monday	**September 4**	Labor Day: no classes
Monday	**September 18**	Early warnings due
Friday	**October 6**	Deadline for make-up of *I* grade from Spring2
Monday	**October 9**	Columbus Day: no classes
Tuesday	**October 17**	Last day to drop with a *W* (60% point)
Monday	**October 23**	Student faculty evaluation period begins
Monday	**October 30**	Registration for winter begins
Tuesday	**November 21**	Thanksgiving recess begins after classes
Monday	**November 27**	Classes resume
Friday	**December 1**	Student faculty evaluation period ends Fall term ends after classes
Sunday	**December 3**	Final grades due
Tuesday	**December 5**	Final grades posted

2017 Winter Term

Monday	**December 4**	Classes begin
Friday	**December 15**	Vacation begins after classes
Tuesday	**January 2**	Classes resume
Monday	**January 15**	Early warnings due
Thursday	**February 15**	Last day to drop with a *W* (60% point)
Friday	**February 16**	Vacation begins after classes
Monday	**February 26**	Classes resume
Friday	**March 2**	Deadline for make-up of *I* grade from fall
Monday	**March 5**	Registration for spring2 begins Student faculty evaluation period begins
Friday	**March 30**	Vacation begins after classes
Monday	**April 9**	Classes resume
Friday	**April 13**	Student faculty evaluation period ends Winter term ends after classes

Sunday	**April 15**	Final grades due
Tuesday	**April 17**	Final grades posted

2018 Spring2 Term

Monday	**April 16**	Classes begin
Friday	**April 20**	Graduation applications due
Friday	**May 11**	Deadline for make-up of *I* grade from winter
Monday	**May 14**	Early warnings due Student faculty evaluation period begins
Friday	**May 25**	Last day to drop with a *W* (60% point)
Monday	**May 28**	Memorial Day: no classes
Thursday	**June 21**	Student faculty evaluation period ends Spring2 term ends after classes
Saturday	**June 23**	Final grades due PN Commencement
Monday	**June 25**	Final grades posted

General Information

The college is part of the Vermont State Colleges (VSC) system that includes Castleton University, Northern Vermont University, and the Community College of Vermont. Vermont Tech offers collegiate-level programs leading to certificates, associate degrees, and bachelor's degrees in agriculture; business; engineering technologies; applied technologies; allied health and nursing; and sustainable technology.

Vermont Tech provides students with a rigorous, broad-based background in technology and applied sciences. Graduates are well-prepared to work with scientists, engineers, and other professionals in meeting the challenges of today's high-tech workplace. They find career opportunities in business, industry, commerce, transportation, agriculture, healthcare, construction, government, and advanced manufacturing.

Vermont Tech Mission Statement

We provide career-focused technical and professional education in a caring community which prepares students for immediate workplace success and continued learning.

Institutional Values

Vermont Tech emphasizes the core values of dedication, integrity, and responsibility as a foundation for learning, career preparation, and citizenship.

Vermont Tech is dedicated to its tradition of helping students reach their full potential by developing their academic and scholarly proficiency; critical thinking and communication skills; civic responsibility; and global awareness.

The faculty, staff, administration, and students at Vermont Tech are committed to forming a stimulating, compassionate, and supportive learning community which fosters the personal and professional growth of all members.

Vermont Tech values its role in supporting the Vermont economy and meeting the needs of businesses by preparing highly qualified graduates in various occupations, as well as by providing businesses with opportunities for continuing education for their employees.

Institutional Objectives

- Establish a high-quality academic environment
- Broaden students' experiences, both academically and socially
- Emphasize the combination of theoretical concepts and practical applications in the curriculum
- Prepare students to adapt to changing technology
- Offer academic and personal support services that enhance student learning
- Furnish placement services for students, graduates, and alumni
- Afford opportunities for faculty and staff development
- Pursue strong liaisons with Vermont elementary and secondary schools
- Inform the general public and potential students of opportunities at Vermont Tech
- Encourage a large and diverse population to enter Vermont Tech
- Strengthen relationships with our community partners
- Provide outreach programs to meet the needs of entrepreneurs, employers, and employees
- Maintain continuing communication and relationships with alumni

Vermont State Colleges Mission Statement

For the benefit of Vermont, the Vermont State College system provides affordable, high-quality, student-centered, and accessible education, fully integrating professional, liberal, and career study, consistent with student aspirations and regional and state needs.

This integrated education, in conjunction with experiential learning opportunities, assures that graduates of VSC programs will:

- Demonstrate competence in communication, research, and critical thinking
- Practice creative problem-solving, both individually and in collaboration
- Be engaged, effective, and responsible citizens
- Bring to the workplace appropriate skills and an appreciation of work quality and ethics

- Embrace the necessity and joy of lifelong learning for personal and professional growth

The Vermont State College system provides continuing educational opportunities for individuals to meet their specific goals.

History

In Public Act No. 1 of 1866, the Vermont legislature established the first public schools in Vermont devoted to the education of teachers. The schools were located in Randolph, Johnson, and Castleton. The Randolph State Normal School served in this capacity until 1910, when the legislature determined that there was a need for a state agricultural school and established the Vermont School of Agriculture (VSA) at the Normal School site.

Over its long years of service, the VSA graduated many Vermonters who were distinguished by their numerous and notable contributions to agriculture and government.

In response to evolving educational needs, technical courses were added to the offerings of the school in 1957 and the institution was given a new name reflecting this expanding mission: Vermont Agricultural and Technical Institute (VATI). It was the first technical institute in Vermont with an initial enrollment of approximately 75 students.

By act of the 1961 legislature, VATI and the state teacher colleges (Castleton, Johnson, and Lyndon) were placed under the control of a newly created public corporation known as Vermont State Colleges. Community College of Vermont joined the other state colleges in 1975.

The name VATI was changed to Vermont Technical College on July 1, 1962 and the college was authorized to grant associate of applied science degrees. The associate of engineering degree was first granted in 1965.

Another milestone was reached on May 7, 1993 when the Vermont State Colleges Board of Trustees approved the college's first baccalaureate degree program: the Bachelor of Science in Architectural Engineering Technology. Students may now enroll in sixteen additional baccalaureate programs leading to bachelor of science degrees.

Nursing programs were added to the college curriculum in 1994 when Vermont's three schools of practical nursing became part of the Vermont Tech community. Beginning in the fall of 1996, Practical Nursing (PN) became a credit-bearing program that could also be applied toward a two-year Associate Degree in Nursing (ADN) from Vermont Tech. The Bachelor of Science in Nursing (BSN) was added in 2013.

In 2015, Vermont Tech's NEASC accreditation was updated to include the offering of master's degrees with the launch of its Master of Science in Software Engineering. The college also began offering more certificate programs in allied health, agriculture, and computer science.

Location

Vermont Tech's main campus in Randolph Center is located on over 544 acres. Interstate 89 passes within one mile of the campus. Buses from the metropolitan areas serve the area and Amtrack's Vermonter stops in downtown Randolph twice daily.

Vermont Tech also maintains a campus in Williston, Vermont. The Williston campus is accessible from exit 12 off Interstate 89.

The college operates ten nursing campuses throughout the state.

Academic Recognition

By authority conferred by the Vermont legislature, the Trustees of Vermont State Colleges have authorized Vermont Tech to grant the degrees of associate of applied science, associate of science, associate of engineering, and bachelor of science with a major in the program pursued.

The Vermont Academy of Science and Technology (VAST) at Vermont Tech has Independent School Approval for grade 12 from the Vermont State Board of Education.

Vermont Tech is an institutional member of the New England Association of Schools and Colleges, the Vermont Higher Education Council, and the American Society for Engineering Education.

Accreditation

Vermont Tech is accredited by the New England Association of Schools and Colleges Commission on Institutions of Higher Education (NEASC).

The following programs are accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org: Architectural & Building Engineering Technology; Architectural Engineering Technology; Civil & Environmental Engineering Technology; Computer Engineering Technology; Electrical Engineering Technology; Electromechanical Engineering Technology; Mechanical Engineering Technology.

The Automotive Technology program is accredited by NATEF (ASE), 101 Blue Seal Dr, SE, Suite 101, Leesburg, VA 20175.

The Dental Hygiene associate degree program is accredited by the Commission on Dental Accreditation, 211 East Chicago Ave, Chicago, IL 60611-2678, (312) 440-4653.

The Nursing programs, including the LPN and RN re-entry programs, are approved by the Vermont State Board of Nursing. The Vermont State Board of Nursing can be contacted at the Office of Professional Regulation, Board of Nursing, 89 Main St, 3rd Floor, Montpelier, VT 05620-3402. All Nursing programs are accredited by the Accreditation Commission of Education in Nursing (ACEN). The Accreditation Commission of Education in Nursing can be contacted at 3343 Peach Tree Rd, NE, Suite 500, Atlanta, GA 30326.

The Respiratory Therapy program is accredited by the Commission on Accreditation for Respiratory Care, 1248 Harwood Rd, Bedford, TX 76021-4244, 817-283-2835.

The Veterinary Technology program is accredited by the American Veterinary Medical Association as a program for educating veterinary technicians at 1931 North Meacham Rd, Suite 100, Schaumburg, IL 60173.

Vermont Academy of Science & Technology

The Vermont Academy of Science and Technology (VAST) provides an opportunity for high school seniors with a strong interest and ability in science and math to complete their senior year at Vermont Tech. Recognized by the state of Vermont as an approved independent high school, the program awards high school diplomas. Because Vermont state law allows VAST students to transfer Vermont Tech credits back to their sending high schools, students may receive a second high school diploma from that school.

Applications for VAST are accepted until May 1 and decisions are made regarding acceptance into the program by May 15. Any available seats available after May 15 are filled on a rolling basis.

Entry into VAST is competitive. Students should have a strong academic transcript and one of three standardized tests (SAT, ACT, PSAT) with scores in the following ranges: SAT scores of 550 for each subsection, ACT scores of 21 for each subsection, and/or PSAT scores of 28 or higher for each subsection. VAST students are expected to maintain at least a 2.0 GPA while attending Vermont Tech or are required to return to their sending high school. To be eligible for a VAST diploma, students must have a minimum of a 2.0 GPA and meet the minimum number of credits as required by the state of Vermont. VAST students are also expected to adhere to all policies and procedures outlined in the Vermont Tech student handbook.

Upon completion of the one-year program, students may remain at Vermont Tech to complete a degree or transfer to another institution. Students who remain at Vermont Tech after graduation are awarded the VAST Forward Scholarship in the amount of $3,000 per year, awarded for up to three years.

The Vermont legislature has provided that a Vermont student's general state support grant for the senior year of high school may be used to cover tuition for VAST. Vermont Tech provides financial aid to Vermont residents for any gap that may exist between the state grant and its tuition, enabling Vermonters to attend VAST tuition-free. Other non-tuition fees, including room and board for students who choose to live on campus, are the responsibility of the student.

Campus Facilities

Randolph Center Campus

Vermont Tech's main campus is located in Randolph Center. The school has a long history of education, both as a teacher training school and a post-secondary agricultural institution. Today, it offers a wide range of programs leading to bachelor's and associate degrees in engineering technology, agriculture, nursing, allied health, and renewable energy.

With four residence halls, two dining facilities, academic buildings equipped with laboratories for numerous technical majors, distance education with Telepresence technology, conference facilities, and our own ski tow, Vermont Tech's main campus is equipped to offer the full traditional college experience. The campus includes a solar array and anaerobic digester that help the campus operations displace an equivalent quantity of electricity to its normal usage, as well as a farm to support the agriculture programs and provide nutrients to the digester. The campus also acts as an anchor for the wider community and a resource for non-traditional students and lifelong learners.

The Randolph Center Campus is part of the Central Region of Vermont Tech's Nursing program.

Williston Campus

Vermont Tech's Williston campus offers a wide array of degree and certificate programs for part-time or full-time students. This campus has been designed to make our top-notch technical education programs available to students looking for a suburban setting with optional housing.

The Williston campus is rapidly expanding, both physically and in terms of enrollment. Programs currently offered include Dental Hygiene; Nursing; Respiratory Therapy; Aviation; Electrical and Computer Engineering Technology; Computer Information Technology and Software Engineering; and Business Management. The campus also supports a wide array of degree and non-degree workforce-education programs for area businesses.

The Williston campus is part of the Northwest Region of Vermont Tech's Nursing program.

Bennington Campus

Vermont Tech's Bennington Campus is located at 210 South Street in the historic Bjur Building, which was built in 1920. The college renovated two floors of the building to create a spacious, well-equipped learning environment where the Paramedicine certificate, PN certificate, and ADN programs are offered. There are two simulation labs, a distance-education classroom that uses Telepresence technology, a computer/library resource room, a student lounge, and a meeting area.

The Bennington campus is part of the Southwest Region of Vermont Tech's Nursing program.

Brattleboro Campus

Vermont Tech's Brattleboro Campus is located at 41 Harmony Place in the historic Brooks House on Main Street. This campus began as the Thompson School of Nursing shortly after the Civil War and holds the distinction of being one of the first practical schools of nursing in the United States. Brooks House was beautifully restored in 2014, just before Vermont Tech took residence along with the CCV.

The PN and ADN programs are offered at this campus. There are two nursing classrooms, a distance-education classroom that uses Telepresence technology, a nursing-skills lab, and a simulation lab with adult and pediatric simulators.

The Brattleboro campus is part of the Southeast Region of Vermont Tech's Nursing program.

Lyndon Site

Vermont Tech's Lyndon site is located in Vail Hall at Lyndon State College, Room 120 and has a distance-education classroom that uses Telepresence technology.

Lyndon-based PN and ADN students have their clinical experience at Northeastern Vermont Regional Hospital (NVRH), as well as several long-term care facilities and health care agencies in the area. The nursing-skills lab and simulation lab for this site are located at NVRH.

The Lyndon site is part of the Northeast Kingdom Region of Vermont Tech's Nursing program.

Middlebury Site

Vermont Tech's Middlebury site is located at the Patricia Hannaford Career Center at 51 Charles Avenue.

The PN and ADN programs are offered in alternate years at this campus. The PN program begins each fall of even-numbered years and the ADN programs begins each fall of odd-numbered years. There is a distance-education classroom that uses Telepresence technology and a nursing-skills lab in the facility.

The Middlebury site is part of the Southwest Region of Vermont Tech's Nursing program.

Newport Site

Vermont Tech's Newport site is located in the North Country Career Center at 209 Veterans Avenue and has a distance-education classroom that uses Telepresence technology to deliver the PN and ADN programs. Newport-based students have their clinical experience at North Country Hospital (NCH), as well as several agencies in the area. NCH partners with Vermont Tech to provide clinical instruction by a nurse educator employed at the hospital. The nursing-skills lab and simulation lab for this site are located at NCH.

The Newport site is part of the Northeast Kingdom Region of Vermont Tech's Nursing program.

Springfield Site

Vermont Tech's Springfield site is located in the Howard Dean Education Center at 307 South Street where both the PN and ADN programs are offered. There is a distance-education classroom that uses Telepresence technology and a nursing-skills lab in the facility.

The Springfield site is part of the Southeast Region of Vermont Tech's Nursing program.

St. Albans Site

Vermont Tech's St. Albans site is located at CCV at 142 South Main Street and has a distance-education classroom that uses Telepresence technology.

The PN and ADN programs are offered at this site. St. Albans-based students have their clinical experience in the St. Albans community. Students use the Williston campus for access to the nursing-skills lab and simulation lab.

The St. Albans site is part of the Northwest Region of the Vermont Tech Nursing program.

White River Junction Site

Vermont Tech's White River Junction site is located at the Upper Valley CCV in Wilder and has a distance-education classroom that uses Telepresence technology.

The PN, ADN, and Respiratory Therapy programs are offered at this site. White River Junction-based students have their clinical experience at Dartmouth Hitchcock Medical Center, Mt. Ascutney Hospital, and Alice Peck Day Hospital. The nursing-skills lab and simulation lab for this site are located at Upper Valley CCV.

The White River site is part of the Northeast Kingdom Region of Vermont Tech's Nursing program.

Admissions

The admission process includes a review of all transcripts, letters of recommendation, extra-curricular experiences, essays, and performance on standardized tests, as applicable. Admission is offered to those candidates whose credentials indicate the greatest promise of success in their academic pursuits. Applicants who do not meet the normal admission requirements may be admitted with provisional status. Provisional acceptances may include such requirements as summer coursework prior to enrolling or additional coursework while enrolled.

Application Deadlines

Vermont Tech has a policy of rolling admission for most majors. This means that we process applications throughout the year until we determine that we have filled each semester's class. We reserve the right to close admission once the class is filled. Applicants are notified promptly of admission status after review of a complete student file.

Because admission to some programs is exceptionally competitive, decisions on applicants to these programs are not normally made until the entire applicant pool has been received. The priority application deadlines for these selected majors are:

Dental Hygiene, Practical Nursing, Veterinary Technology	December 1
Associate Degree in Nursing	March 15
VAST (priority deadline)	May 1

After the initial round of reviews, complete files are reviewed on a rolling admission, space-available basis.

Standardized Testing

All freshman admission candidates are required to take either the SAT I, ACT, or Accuplacer. Applicants who are already out of high school are not normally required to take these exams.

The College Entrance Examination Board code for Vermont Tech is *3941*. The ACT code number is *4323*.

First-Year Applicant Requirements

If you have never previously attended any college or university, please submit:

- Completed application
- $47 application fee
- Official high school transcript with at least the first marking period grades of the senior year or official scores from a high school equivalence exam (GED)
- SAT I, ACT, or Accuplacer results
- Personal essay (250-300 words; discuss your motivation for pursuing a degree at Vermont Tech or write about a topic of your choice)

Transfer Applicant Requirements

If you have previously taken college-level work at another college or university, please submit:

- Completed application
- $47 application fee
- Official high school transcript or official scores from a high school equivalency exam (GED)
- Official transcript(s) from all colleges previously attended (seeking transfer credit or not)
- Official transcript(s) from any other VSC school attended prior to the 2002 summer term
- Personal essay (250-300 words; discuss your motivation for pursuing a degree at Vermont Tech or write about a topic of your choice)

Additional Requirements for Paramedicine Certificate

- Valid EMT license
- Healthcare provider-level CPR card
- Two letters of reference from an ALS provider familiar with your character, abilities, and capability to succeed

Vermont Academy of Science & Technology Applicant Requirements

If you are applying to this accelerated high school program, please submit:
- Completed application
- $47 application fee
- Official high school transcript with at least the first marking period grades of the junior year *or* a home school plan
- PSAT, SAT I, or ACT results
- Two letters of recommendation (one from a teacher, one from a guidance counselor or principal)
- Personal interview
- College-administered placement test
- Essay about why you are applying to the Academy; Please address the following: What do you envision yourself doing ten years from now? How do you think attending the Academy will help you reach these goals? What can you contribute to the Vermont Tech community? Describe a significant event in your life and how it has affected you.

The priority application deadline for VAST is May 1. We accept applications after this date.

Master's Degree Applicant Requirements

- Completed application
- $47 application fee
- Official transcript(s) from all colleges previously attended (seeking transfer credit or not)
- GRE results
- Personal essay (250-300 words; discuss your motivation for pursuing a degree at Vermont Tech or write about a topic of your choice)

Nursing, Respiratory Therapy, Dental Hygiene Applicant Requirements

If you are applying to one of the allied health programs, please submit:
- Completed application (indicate your first choice location only)
- $47 application fee
- Official high school transcript or official scores from a high school equivalency exam (GED)
- Official transcript(s) from all colleges previously attended (seeking transfer credit or not)
- SAT I or ACT results, if available
- Vermont Tech placement test scores
- Two signed letters of recommendation, dated within the past six months, on letterhead. Letters should address your work ethic, communication skills, potential for adaptation to a fast-paced clinical environment, and potential to competently and compassionately deliver healthcare to patients across the lifespan. Letters from family members or friends cannot be accepted. Please see our guidelines for recommenders at www.vtc.edu/apply
- Personal essay (250-300 words; discuss your motivation for pursuing a degree at Vermont Tech or write about a topic of your choice)
- (*Nursing only*) Prior to start of classes, provide proof of current Health Provider CPR certification

All Nursing, Dental Hygiene, and Respiratory Therapy students are required to pass a background check prior to June 1 (see policy).

Additional Requirements for Associate Degree in Nursing
- A copy of your current LPN license (without any sanctions/restrictions)
- If you are not a graduate of the Vermont Tech PN program, you must show completion of college-level equivalency for: Anatomy & Physiology (8 credits), Nutrition (3 credits), and Human Growth & Development (3 credits)
- If you are a graduate of a non-college PN program, you must submit a program transcript
- Proof that you have passed the PN National Council Licensure Exam (NCLEX-PN)
- If you are a current PN student, you must receive a minimum GPA of 3.0 or higher during each of the PN semesters. If a LPN graduate, you must have a GPA of 3.0 in your LPN coursework. BIO 2120, ENG 1061, MAT 1040, PSY 1010, and/or an approved arts/humanities elective may be taken after LPN graduation to improve your GPA to a 3.0 level
- If you are not a current Vermont Tech PN student, you must submit two signed

recommendations on letterhead that address your clinical competence, work ethic, interpersonal skills, and potential transition to a RN role, particularly with respect to leadership, management, and accountability.

PN students attempting to complete courses for the ADN program may not enroll in spring or summer courses at any VSC institution until their spring term is complete.

Additional Requirements for Bachelor's Degree in Nursing
For non-VTC applicants, see *Program Prerequisites*.

Nursing Direct Progression Policy
A student accepted into either the PN or the ADN program may progress directly to the next level nursing program at Vermont Tech without having to reapply if they qualify. Please refer to the Nursing curriculum pages for more information.

Nursing Policy for Criminal Background Checks & Drug Screening
To ensure the safety of any and all patients under the care of Vermont Tech nursing students and to ensure the safety of all faculty and students,all PN and ADN students are required to have a criminal background check (CBC) which includes FBI fingerprinting. This CBC must be completed and reviewed prior to the first day of class. In the event that the student is admitted late, this CBC must be completed and reviewed prior to any clinical experience. Any student who fails to comply with this process will not be allowed to continue in the program. The school uses the information reported to us for screening purposes and to secure clinical placements. In the event that there are positive findings (either convictions on the CBC or positive drug screens at the sites that require them), the Associate Dean of Nursing and a member of the college's administration review the information and meet with the student. The student must provide a written explanation of any and all convictions and positive drug screens prior to this meeting. Court documents must be provided that detail the disposition of the case. Failure to do this will result in dismissal from the program. The Associate Dean of Nursing and the college administrator review all provided documentation and make a determination on the student's enrollment status in the Nursing program.

Students must report any convictions that occur after the CBC while enrolled in school.

A third-party vendor conducts the CBC and drug screens and maintains the records. Accepted students are given instructions on when and where to complete these with their admission packets.

International Applicant Requirements

If you are applying as an international student, please submit:

- Completed application
- $47 application fee
- Official secondary school transcript evaluated by World Education Services (www.wes.org) or an equivalent international transcript evaluator
- Official college/university transcript (if applicable) with course-by-course evaluation by WES or an equivalent international transcript evaluator
- Personal essay (250-500 words on a topic of your choice)
- Official TOEFL score if English is not your first language. The minimum score required is 500 for the paper test, 173 for the computer test, and 61 for the internet test. IELTS is also accepted with a recommended score of 5.5 or higher for all Engineering, Allied Health, and Professional Pilot Technology majors. A score of 5 or higher is accepted for the following majors: Business Technology & Management, Computer Information Technology, Construction Management, Diversified Agriculture, and Landscape Design & Sustainable Horticulture. The Pearson test is accepted and a score of 44 or higher is recommended
- Official financial statement indicating your ability to pay one full year of tuition, room, and board. Proof must be provided on official bank letterhead and is needed before an I-20 can be issued
- A copy of your passport information page with your complete name, date of birth, country of birth, and country of citizenship

International students are encouraged to apply between the months of November and April due to the lengthy visa process. Upon acceptance, international students are required to submit a $300 deposit before we issue your I-20. The $300 is credited to the fall semester bill.

English for Speakers of Other Languages (ESOL)

According to language acquisition experts, non-native speakers of English need five to seven years of consistent exposure to oral and written academic language to achieve proficiency in college-level work. With this fact in mind, the following conditions and recommendations apply:

- Vermont Tech's writing placement test determines the student's appropriate English course. If the student's English skills are below the minimum level, they must take ESL 0141. The ESOL student must achieve at least a *B* and demonstrate improved skills in two post-course placement tests in order to advance
- ESOL students who place in higher-level English courses benefit from structured time at the Center for Academic Success. Tutors work with students to improve reading and writing skills. In addition, ESOL software in vocabulary, grammar, and pronunciation are available for study and practice
- Students who do not achieve a placement level of 3 or its equivalent may require extra terms to complete their degree program
- Students at all sites have access to ESOL support

Placement Testing

Students who are provisionally accepted may be required to take placement tests in English and mathematics. Test results are used to ensure that students are placed in the correct courses at registration.

Students who have completed a bachelor's degree at a regionally accredited US college or university or have met the English and mathematics program requirements may be exempted.

If a student's skills are below minimum levels, they are required to take developmental courses in the appropriate areas. This results in additional coursework and a longer overall enrollment period.

A student has the right to retest one time if dissatisfied with their original score.

Acceptance guidelines for Nursing, Dental Hygiene, and Respiratory Therapy include placement into freshman-level English and minimum Accuplacer scores of at least 70 on arithmetic and at least 40 on algebra for Nursing and Dental Hygiene, 50 for Respiratory Therapy. Testing may be waived if an applicant has previous assessment testing from another VSC or if the applicant has approved transfer credit in English and mathematics.

Admission & Housing Deposits

Accepted students must remit a tuition deposit of $200 on or before May 1 for the fall semester or December 15 for the spring semester. An additional $100 housing damage deposit is required for students who are planning to live on campus. After these dates, deposits are accepted on a space-available basis. The tuition deposit is credited toward the first semester's bill and is non-refundable after May 1.

Transfer Credit

If an applicant has attended another VSC school prior to the 2002 summer term or another college outside the VSC system, Vermont Tech requires official transcripts. These should be sent directly to the Office of Admissions from the college at the time of application.

Transcript evaluations are available upon request.

Generally, credit for applicable college courses taken may be granted for those courses completed at a regionally accredited institution with a grade of *C*- or better or *C* for any science course required for PN, ADN, BSN, DHY, or RSP; however, the transferred grades are not computed into a student's GPA. For our Allied Health programs, science courses need to be completed within the last ten years in order for transfer credit to be awarded.

Courses taken at an accredited institution on a pass/fail basis may be transferred. Vermont Tech may require the student to obtain a grade equivalent in the course from the institution at which the course was taken.

Examinations may be required to show competence in subject material. Vermont Tech is the final judge as to what transfer credit it accepts. Transfer credit varies depending upon a number of factors, such as the student's academic record; the college or university attended; and the program selected.

Credits earned within the VSC are transferable to other colleges or universities only at the discretion of the receiving institution.

Advanced Standing

Admission candidates may be granted advanced standing in a degree program by transfer of courses from other accredited post-secondary institutions, advanced placement examination, recognized equivalent military courses, credit by challenge examinations, or previous relevant experience.

Consideration of previous relevant experience for credit is initiated by a completed academic portfolio to the department chairs through the Dean of Academic Affairs. If approved, the portfolio is returned to the Office of the Registrar with the signatures of approval from the program's department chair, the credit-granting department, and the Academic Dean. The college may require a challenge exam in these cases.

Advanced standing toward a degree program is subject to the following restrictions: no more than 50% of the total required credits may be obtained by advanced standing for an associate degree or the +2 portion of a bachelor's degree. No more than 50% of the total major technical course credits in an academic program may be obtained by advanced standing.

Non-Degree Students

Non-degree students may register two weeks prior to the start of the term. Students who wish to enroll for coursework but not for a program must meet the prerequisite requirements for the courses for which they register and are subject to the same academic regulations and standards as degree students.

Registration for courses is subject to the availability of those courses, with initial priority being given to degree students. Non-degree students register for classes through the Office of the Registrar. There is no online registration for non-degree students nor are they eligible for federal financial aid.

Student Registration, Schedules, & Class Listings

Vermont Tech courses are available online at https://webservices.vsc.edu. Click on *Prospective Students* and then *Search for Sections*.

All of the Vermont Tech terms start with the letter *T*. For example, *T17FA* translates to the fall 2017 term at Vermont Tech.

First-year students are registered by the Office of the Registrar after they pay their tuition deposit. Registration for continuing students is completed in the prior term. There is no online registration for new students.

During orientation and the first week of classes, students may meet with advisors or department representatives regarding schedule changes.

Vermont Tech Program Prerequisites

Program	Degree	Prerequisite
Advanced Software Development	**C**	Associate degree or higher from a regionally accredited institution
Agribusiness Management Technology	**AAS**	Algebra I; algebra II recommended, 2 years of science (CHE preferred)
Applied Business Management	**BS**	50 transferrable higher education credits
Architectural & Building Engineering Technology	**AAS**	Algebra I & II; geometry; lab physics or chemistry (PHY preferred)
Architectural Engineering Technology	**BS**	Algebra I & II; geometry; lab physics or chemistry (PHY preferred)

Program	Degree	Prerequisite
Automotive Technology	**AAS**	Algebra I; algebra II recommended; geometry; lab physics or chemistry recommended
Business Technology & Management	**AAS, BS**	Algebra I; algebra II recommended
Civil & Environmental Engineering Technology	**AE**	Algebra I & II; geometry; lab physics or chemistry
Computer Engineering Technology	**AE, BS**	Algebra I & II; geometry; lab physics or chemistry (PHY preferred)
Computer Information Technology	**AS, BS**	Algebra I & II; geometry; lab physics or chemistry
Computer Networking	**C**	Associate degree or higher from a regionally accredited institution
Computer Software Development	**C**	Associate degree or higher from a regionally accredited institution
Computer Software Engineering	**AS, BS**	Algebra I & II; geometry; lab physics or chemistry
Computer Software Engineering	**MS**	Bachelor's degree from a regionally accredited institution; GRE scores; one letter of recommendation
Construction Management	**AAS**	Algebra I; algebra II recommended; geometry; lab physics or chemistry recommended
Construction Management	**BS**	Completion of AAS in Construction Management or AE in Civil & Environmental or Architectural Engineering Technology
Dairy Farm Management	**AAS**	Algebra I; algebra II recommended; 2 years of science (CHE preferred)
Dairy Production & Processing	**C**	Algebra I; algebra II recommended; 2 years of science (CHE preferred)
Dental Hygiene	**BS**	Algebra I & II; geometry; lab biology; lab chemistry; minimum Accuplacer scores of 70 for arithmetic, 40 for algebra; freshman English placement; 2 letters of recommendation
Dental Hygiene (degree completion)	**BS**	AS in DHY with 2.50 minimum GPA; 2 letters of recommendation
Diesel Power Technology	**AAS**	Algebra I; algebra II recommended; geometry; lab physics or chemistry recommended
Diesel Technology	**C**	Algebra I; algebra II recommended; geometry; lab physics or chemistry recommended
Diversified Agriculture	**BS**	Algebra I & II; lab physics or chemistry
Electrical Engineering Technology	**AE, BS**	Algebra I & II; geometry; lab physics or chemistry (PHY preferred)
Electromechanical Engineering Technology	**BS**	Completion of AE program in EET, MEC, or equivalent
Entrepreneurship	**AAS, BS**	Algebra I; algebra II recommended
Equine Studies	**AAS**	Algebra I; algebra II recommended; biology; lab chemistry
Fire Science	**AAS**	Algebra I; algebra II recommended; geometry; lab physics or chemistry (CHE preferred)
Forestry	**C**	Algebra I; algebra II recommended; 2 years of science (CHE preferred)
General Engineering Technology	**AAS**	Algebra I & II, geometry; lab physics or chemistry (PHY preferred)
Landscape Design & Sustainable Horticulture	**AAS**	Algebra I; algebra II recommended; 2 years of science (lab courses preferred)
Manufacturing Engineering Technology	**BS**	Algebra I & II, geometry; lab physics or chemistry (PHY preferred)
Mechanical Engineering Technology	**AE**	Algebra I & II, geometry; lab physics or chemistry (PHY preferred)
Nursing	**C**	Algebra I; lab chemistry; lab biology or college-level Anatomy & Physiology (within the last 10 years); minimum Accuplacer scores of 70 for arithmetic, 40 for algebra; freshman English placement; 2 letters of recommendation

Program	Degree	Prerequisite
Nursing	**AS**	LPN licensure with 3.0 minimum GPA; minimum Accuplacer scores of 70 for arithmetic and 40 for algebra; freshman English placement; 2 letters of recommendation; current PN students: see *Direct Progression Policy*;
Nursing	**BS**	Unencumbered active US RN license; RN graduate of a nationally accredited Nursing program; 2.50 minimum ADN GPA; BIO 1030, 2011, 2012, 2120; ENG 1060/1061; MAT 1040; PSY 1010,1050
Paramedicine	**C**	Valid EMT license; healthcare provider-level CPR card; two letters of recommendation
Professional Pilot Technology	**BS**	Algebra I & II; geometry; lab physics or chemistry
Renewable Energy	**BS**	Algebra I & II; geometry; lab physics or chemistry
Respiratory Therapy	**AS**	Algebra I; lab chemistry; lab biology (within the last 10 years); minimum Accuplacer scores of 70 for arithmetic, 40 for algebra; freshman English placement; 2 letters of recommendation
Veterinary Technology	**AAS**	Algebra I & II; biology; lab chemistry
Web Development	**C**	Associate degree or higher from a regionally accredited institution

AAS: Associate of Applied Science

AE: Associate of Engineering

AS: Associate of Science

BS: Bachelor of Science

C: Certificate Program

MS: Master of Science

Definition of a Vermont Resident

For the Policy on Determination of In-State Residency for Tuition Purposes, see Policy 301 at vtc.edu/state-residency-policy

RSP-Approved Programs

Vermont Tech participates in the Regional Student Program (RSP) of the New England Board of Higher Education. Under this agreement, students from other New England states pay 150% of the in-state tuition per academic year if the student enters an eligible program under the RSP pact. A program not generally eligible because it is also offered in a student's home state may be eligible if the student's legal residence is closer to Vermont Tech than to the home state institution. State eligibility is subject to change without notice.

	CT	MA	ME	NH	RI
Agribusiness Management	o	o	o		o
Architectural & Building Engineering Technology		o			o
Architectural Engineering Technology	o		o	o	o
Automotive Technology					o
Business Technology & Management (2 year)	o	o		o	
Business Technology & Management (4 year)			o	o	
Civil & Environmental Engineering Technology (2 year)					o
Computer Engineering Technology (2 year)			o		
Computer Engineering Technology (4 year)			o		o
Computer Information Technology (2 year)					o
Computer Software Engineering (2 year)		o	o	o	o

	CT	MA	ME	NH	RI
Computer Software Engineering (4 year)		o			
Construction Management (2 year)	o	o			o
Construction Management (4 year)		o		o	o
Dairy Farm Management		o	o		o
Dental Hygiene	o	o		o	
Diesel Power Technology	o				o
Diversified Agriculture		o	o		o
Electrical Engineering Technology (4 year)				o	o
Electromechanical Engineering Technology	o	o	o	o	o
Entrepreneurship (4 year)	o				o
Equine Studies			o		o
Fire Science	o				
Landscape Design & Sustainable Horticulture			o		o
Manufacturing Engineering Technology				o	o
Mechanical Engineering Technology			o		
Renewable Energy	o	o	o	o	o
Veterinary Technology					o

Good Neighbor Policy

Reduced tuition rates are available for residents of the following states and counties:

Massachusetts	Berkshire, Franklin
New Hampshire	Coos, Grafton, Sullivan, Cheshire
New York	Clinton, Essex, Washington, Rensselaer

Dual Enrollment

Dual enrollment programs allow a student to take college courses, sometimes concurrently, while still in high school. Dual enrollment programs may be found at the home high school, a regional technical center, or a college campus.

Students who take advantage of the dual enrollment program receive a VSC transcript. Credits earned can then be used to further the students' education at Vermont Tech or at other participating post-secondary institutions. A college transcript provides evidence of a student's academic ability and ambitions for furthering their education. This may assist students seeking entrance into their chosen college. Acceptance of transfer credits is at the discretion of the receiving post-secondary institution.

While participation in dual enrollment does not reduce financial expenses at Vermont Tech, other benefits of the program include getting a jump start on college courses, taking advantage of a lighter credit load during the first semester, taking additional courses to balance out other occupational desires, or trying out a college course in a non-threatening venue.

Orientation

Prior to the start of the fall and spring terms, the college sends accepted applicants detailed instructions on orientation and how to view class registration online. This includes information on housing assignments, recommended room furnishings, rules for cars on campus, and other general items.

Academic Affairs

Academic Advising

Vermont Tech is committed to providing comprehensive advising designed to enrich the educational experience of every student. Students are assigned academic advisors, usually within their program department, and are encouraged to meet with their advisors throughout the academic year to discuss their progress and future plans.

Students having academic or personal difficulties may get extra help from faculty advisors to identify problem areas; clarify educational and personal goals; resolve difficulties; and obtain referrals to other campus services.

If students need to change advisors, they should contact the Office of the Registrar.

Attendance & Assignment Requirements

Students are expected to meet the attendance and assignment requirements set by each instructor for each class in which they are enrolled. Failure to meet these requirements may result in removal from the class roster with a failing grade.

In cases of excessive absences and upon the recommendation of the instructor, a student may be dismissed from the college with failing grades.

The make-up of any work missed for any reason is at the discretion of the instructor. Any time a student misses a class, exam, lab, or other scheduled event, it is the student's responsibility to inform the instructor and to make satisfactory arrangements for any make-up work.

Participation in varsity athletic contests may be considered excused absences. Practices are not excused absences. Athletes are responsible for all work missed and the instructor and athlete will make every reasonable effort to establish an acceptable make-up procedure. If no reasonable make-up alternative is possible, academic standing has priority.

Transcripts

Credits earned within the VSC system are not considered transfer credit. All VSC courses taken after the 2002 summer term are included and count in the determination of quality points and GPA on the Vermont Tech transcript.

A transcript is a copy of a student's permanent record of attendance at the college and cannot be altered. Current or former students may request that the college issue an official transcript of their record to any school, employer, or other agency. For each transcript, students must submit a written, signed request to the Office of the Registrar. A transcript fee is charged. Transcripts are sent as soon as possible. Please allow a minimum of five days for normal processing and two weeks following the end of a term. Transcripts are not sent for students who have not satisfied financial obligations to the college.

Grade Amelioration Policy

One time in an academic career and with proper approval, a student who is changing programs or VSC schools may have selected grades excluded from the calculation of their cumulative GPA in the new academic program. Grades may only be excluded for courses that are required in the old program and not required in the new or subsequent four-year program. All credits earned in courses excluded from the calculation are lost. This policy does not apply to electives or credits used for any diploma, certificate, or degree already awarded.

Approval from the student's new program department chair or director is required for grade amelioration. The student must have:

- One term of at least 6 credits with a term GPA of 2.00 or better following the term for which amelioration is requested
- Approval from the Academic Deans of both the home and sending institutions

Grade Point Average (GPA) Calculation

GPA is determined by dividing the quality points earned by the GPA credits attempted. GPA credits are those taken for a letter grade, *A* through *F*. Remedial or zero level letter-graded courses taken count as GPA credits only in the term taken. They are not included in the cumulative GPA.

Grading System

Grade		Quality Points
A+		4.0
A		4.0
A-		3.7
B+		3.3
B		3.0
B-		2.7
C+		2.3
C		2.0
C-		1.7
D+		1.3
D		1.0
D-		0.7
F	*Failure*	0.0
P	*Pass*	0.0
NP	*No Pass*	0.0
I	*Incomplete*	0.0
AU	*Audit*	0.0
W	*Withdrawn*	0.0
CR	*Credit Received (Challenge, AP, CLEP, etc.)*	0.0
TR	*Transfer Credit Received*	0.0

Official grades are issued online at the end of each semester. Unofficial academic warnings are issued online prior to the mid-point of each term.

Auditing Courses

Tuition charges for an audit course are 50% of the full applicable per-credit rate. Students registering to audit a course must do so by the end of the add/drop period.

If space is available, students may audit a Vermont Tech course provided they have met all course prerequisites and have obtained the permission of the instructor. The audit course credit hours are not applied to student credit load or status.

Instructors, in giving permission for an audit, specify the expectations for students participating as an auditor. Students who successfully audit a course receive an *AU* grade, which carries no credit or quality points. Students who do not meet expectations of the audit are dropped from the course with no grade or with a *W* grade. Students may not change to audit status to avoid receiving poor final grades.

Incomplete Work

A grade of *I* applies to work in a course which has not been completed because of illness or other satisfactory reasons. The incomplete work must be made up as specified by the instructor no later than halfway through the subsequent term.

The grade for the course is determined by the quality of the make-up work and previously completed work. If the student fails to complete the assigned work, the instructor determines a default grade that is entered on the student's transcript. A student receiving an *I* grade may enroll in courses for which the incomplete course is a prerequisite. Continued enrollment in the new course is contingent on completion of the incomplete course with a passing grade.

Repeated Courses

When a course is repeated and completed, the initial grade remains on the record but does not count in the GPA or for credit. The most recent grade earned in a course is entered on the record and used in computing the term and cumulative GPA and class rank. If a grade other than a *W* grade is recorded in the repeated course, all attempts appear on the record and the most recent earned grade is used in computing the cumulative GPA.

Add/Drop Period

The normal add/drop period is defined as the first two weeks of classes or the first 15% of class meetings for non-regular offerings. Degree students may add or drop a course until the end of the second week of classes with their advisors' permission. To add a class after the first week, students must have permission from both their advisor and the instructor.

A fee is charged for adding or dropping after the second week. Students pay for any classes dropped after the second week of classes.

Non-degree students must have the instructor's permission to add a course after the first week.

Dropping a Course

A student who drops a course:

- During the normal add/drop period is dropped from the roster and receives no grade
- After the normal add/drop period until the 60% point of a course receives a grade of *W*
- After the 60% point (or fails to drop the course) receives an earned grade whether they attend remaining classes or not. Students who fail to drop a course are responsible for costs incurred

If a student successfully completes a course before withdrawing from the college, they receive an appropriate grade from that course's instructor.

Students who drop courses after the first two weeks of class are not reimbursed unless they withdraw from all their courses for the term.

For students who have enrolled under the VSC Enrollment Consortium Agreement, the school-specific policies and procedures regarding add/drop/withdraw dates and procedures that pertain to each student are those of the home institution.

Withdrawals & Leaves of Absence

To withdraw or take a leave of absence once the term has started, a student must give written notification to Office of the Registrar or off-campus site office. A parent or guardian must approve requests made by minors.

A student who stops attending classes after add/drop who does not inform the college is considered to have withdrawn after the 60% point of the term if the last date of an academic event cannot be determined.

Grades for students on approved withdrawals or leaves of absence are in accordance with the guidelines specified in *Dropping a Course* except that for an approved leave of absence, the *I* or *W* grades may be used after the 60% point until the end of the leave of absence.

If the request is for a medical leave of absence, a letter from the student's health practitioner is required. Students approved for a medical leave of absence based on a letter from their health practitioner must provide a time frame for their return to a normal class schedule. The student is also required to provide another letter stating that they are medically fit to return to their studies.

For a leave of absence to be approved, it is expected that incomplete coursework can be satisfactorily completed upon a student's return. For more information on medical leaves of absence, please review Policy T116 on the Portal.

If a student fails to return to school at the end of an approved leave of absence or if the student makes a written request to rescind the leave of absence, the withdrawal date is the original date of the request for leave or the last date of an academic event, whichever is later.

College policy is followed for students required to take a mandatory leave of absence.

Non-Returning Students

Students who do not intend to return to Vermont Tech for the subsequent term should:

- Complete a non-returning student form at the Office of the Registrar or off-campus site office
- Complete an exit interview with the Office of Financial Aid

Credit by Challenge Examination

Students who can document coursework, private study, or on-the-job experiences equivalent to a Vermont Tech course may receive credit by examination. Approval by a department chair is required.

Documentation must be submitted to the department chair at least three weeks prior to the planned date of testing. After review and acceptance by the chair, an application for credit by examination shall be submitted along with a challenge exam fee. Upon satisfactory completion of the exam, a maximum of 12 credits may be given toward any one program. These credits are subject to advanced standing restrictions.

Challenge exams that are taken to replace failed coursework must comply with all of the above criteria and must document new coursework, private study, or on-the-job experience since the failure occurred.

Waiver of Courses

A student may have a specific course waived. A student can initiate a course waiver by an academic petition to the department chair through the Dean of Academic Affairs. The petition must be approved by the student's program department and by the department offering the course. A waived course may have to be replaced by an alternative course.

Substitution of Courses

A student may substitute another course for a specific required course if the student is unable to take the course for a specific, approved reason. A student can request to substitute by an academic petition to the department chair through the Dean of Academic Affairs. The petition must be approved by the student's program department and by the department offering the course.

Student Class Level

Class level is based on total earned credits toward an academic program. It affects financial aid, class standing, and other calculations regarding student progression. Non-degree students have no class standing.

Level	Earned Credits
Freshman	0-29.99
Sophomore	30-59.99
Junior	60-89.99
Senior	90+

Credit Overload

A student credit overload is defined as a course load in excess of 19 credits in a single term.

Students with a cumulative GPA of 3.00+ may be approved for a load of up to 24 credits in a term. Students with a cumulative GPA of 2.00-2.99 may be approved for a load of up to 21 credits in a term. Students with a cumulative GPA below 2.00 are not approved for a term credit overload. Students with overloads are reviewed at mid-term for possible load reduction.

Academic Standing

At the end of each term, academic standing is calculated for each matriculated student. There are three levels of academic standing:

Good Standing: degree students are in good standing if they meet the enrollment criteria for the term and have a cumulative GPA of 2.00 or better (1.75 for students with fewer than 30 earned credits).
Academic Probation: degree students are placed on academic probation if they have a cumulative GPA below that required for good standing. Probation is not a punitive measure, but is used to identify students who may need additional services or help.
Academic Dismissal: degree students may be academically dismissed from the college for a minimum of one term for:

- Receiving a term or cumulative GPA below .70
- Not achieving good standing while on probation (on probation for more than one semester)

A student may also be dismissed from an individual class at any time when the instructor or Academic Dean determines that continued enrollment is not appropriate: violation of cheating or plagiarism policy, nonattendance, inappropriate behavior, failure to complete assigned work, etc.

A student dismissed during the term receives a grade of *F* or *NP* in any incomplete course.

A student who is dismissed may not enroll in any Vermont Tech course for a minimum of one term. This also applies to consortium enrollment from other VSC institutions. A student returning from academic dismissal is on probation for a minimum of one term.

Appeal of Academic Dismissal
A student who believes there are significant mitigating circumstances shall submit an email letter to the Academic Appeals Committee (AAC).

This letter shall include the student's full name, address, and college identification number. It should fully explain the circumstances surrounding the appeal. The AAC meets and makes a recommendation to the Academic Dean, who makes a final decision regarding the appeal. This decision is final and not subject to further appeal. To read about this process more fully, please see the student handbook.

A student reinstated on appeal is normally reinstated on academic probation. The student must also appeal to the Office of Financial Aid to have their aid reinstated. This is a separate process from the academic appeal.

Disciplinary Dismissal

Students who are dismissed from Vermont Tech for non-academic reasons are no longer matriculated students. They are not eligible to enroll in Vermont Tech courses. These students may apply for re-admission through the Office of Admissions after they have met the conditions set for them at the time of dismissal. Re-admission requires the approval of the Dean of Students.

Returning Students

Previously matriculated students who have not attended Vermont Tech for one term or more (even in instances of courses in a major not being offered) should contact the Office of Admissions and inform them of their intention to return to Vermont Tech. The Office of Admissions advises the student whether they need to complete a new application or whether they can preregister for the upcoming semester with the Office of the Registrar. This determination is based on length of absence, program requirements, and other academic considerations.

If returning to complete the Practical Nursing program within a year of leaving, students must perform a demonstration of all skills learned in the appropriate lab/clinical course from the year before. This must be done prior to reentry. If a student is unable to perform these skills satisfactorily, they are not readmitted to the program. Students who have been out of the program for more than a year must repeat all nursing Principles & Practices courses in the program.

If returning to complete the Respiratory Therapy program after a semester off, students must perform a demonstration of all skills learned in the appropriate labs/clinical course from the year before. This must be done prior to reentry. If a student is unable to perform these skills satisfactorily, they are not readmitted to the program. Students who have been out of the program for more than a year must repeat all RSP courses in the program.

Returning after Dismissal

A student who has been dismissed from the college may return under the following conditions:

- Student has met the requirements placed upon them at the time of dismissal
- Student notifies the Office of Admissions in writing of their intent to return to Vermont Tech
- Student is approved for re-admission by the Office of Admissions
- A Nursing student wishing to return to the Vermont Tech Nursing program after dismissal should refer to *Re-admission After Clinical Dismissal* in the Nursing student handbook

Upon receiving notification from the Office of Admissions, the department chair or program coordinator determines whether a fall or spring re-admission is most appropriate and sends a preregistration to the Office of Admissions outlining coursework or suggested coursework prior to re-admission. The Office of Admissions forwards returning student information to the Office of the Registrar, student housing, and the Office of Financial Aid.

A returning student who wants financial aid has to appeal to the Office of Financial Aid to have their aid reinstated. A new housing contract needs to be completed if the student wishes to live on campus. After returning, the student is on probation and receives increased supervision and academic support for a minimum of one semester.

Changing Programs

If a student wishes to change programs, they must petition through the Office of the Registrar and be approved by the appropriate department chairperson.

Dual Major/Dual Degree

A student who wishes to receive an additional degree or major must complete a Change of Program request form, available from the Office of the Registrar. The student must complete all of the requirements of the new major or degree. Courses that have already been completed do not need to be taken again. An additional associate degree major must contain at least fifteen credits that were not part of the previous major. An additional bachelor's degree major must contain at least thirty credits that were not part of the previous major.

Course schedules are designed for full-time students who are pursuing one major. Therefore, dual majors typically require a minimum of one extra year at Vermont Tech.

A student who earns multiple majors is awarded one degree with the additional majors annotated on the diploma.

Residency Requirement & Matriculation

A matriculated student is one who has been formally accepted by the college as being registered in a degree program. All matriculated students have a minimum number of credit hours that must be taken at Vermont Tech. For bachelor's candidates, the residency requirement is that 30 credit hours, including substantial advanced work in the major, must be achieved in courses specifically taken at a Vermont State College. For associate and certificate candidates, at least 15 credit hours must be achieved in courses taken specifically at Vermont Tech. For master's candidates, at least 18 credit hours of coursework within the major must be completed at Vermont Tech. Exceptions to the residency requirement may be considered and require approval from the Dean of Academic Affairs.

Graduation Standards

A Vermont Tech degree demonstrates not only accomplishment in the major field, but also acquisition of the fundamental transferable skills required for success in today's world. For this reason, Vermont Tech is committed to ensuring that graduates have achieved proficiency in written and oral communication, quantitative reasoning, and information literacy.

All degree students are required to demonstrate competence in these disciplines at the appropriate level for their degree program. Students have more than one opportunity to meet the expected level of performance.

All transfer students are required to take all graduation standards except:

- Students with a bachelor's degree or higher
- Students who have completed the assessments at another VSC college
- Students who are granted a special exemption by the Academic Dean

Procedures for completing the graduation standards are outlined in the Student Handbook.

Graduation Requirements

In order to graduate, a student must:

- Have a 2.00 cumulative GPA
- Complete at least 30 credits of coursework at Vermont Tech for a bachelor's degree program; 15 credits minimum for an associate degree or a certificate program; or 18 credits minimum for a master's degree program
- Complete 60 credits minimum for an associate degree
- Complete 120 credits minimum for a bachelor's degree
- Complete 30 credits minimum for a master's degree
- Satisfy all financial obligations to Vermont Tech
- Apply for graduation

Department chairs submit program candidates who satisfy the above, as attested by the Registrar, to the full college faculty for recommendation to graduate.

Time Limitation on Graduation Requirements

Students are expected to finish their degree programs with continuous enrollment in the specified number of terms outlined in the curriculum for their programs. Students who leave the college for a full-term are assigned the requirements for the catalog that is in effect for the year of their return. These students are expected to meet any new requirements for that catalog year unless the sponsoring department approves an earlier catalog year.

Each student operates under degree requirements in effect at the time of initial acceptance as a degree candidate. If, after two years for a certificate, four years for an associate, or six years for a bachelor's, the degree requirements have not been met, the student must satisfy the graduation requirements in effect during the student's year of graduation.

A student participating in a college-sponsored part-time degree program has two years from the conclusion of the last scheduled course in the sponsored program to complete the degree requirements. After this time, if the degree requirements have not been met, the student must satisfy the graduation requirements in effect during the student's year of graduation.

Requirements for Participating in Graduation

Commencement is an important celebration of a student's academic success, as well as an opportunity for family, friends, and future employers to recognize those efforts in a formal manner. Academic credentials are important benchmarks in a student's career. All students are strongly encouraged to attend commencement.

A student who successfully completes all graduation requirements and is recommended by their department graduates and receives a diploma.

A student who is within 7 credits of the graduation requirements; has applied to walk or graduate on their application; and has the recommendation of their department may participate as a walker. Although walkers participate in the graduation ceremony, they will not actually graduate until they have successfully completed all the graduation requirements and are so recommended by their departments. A walker who subsequently completes their degree requirements must apply for a diploma that is mailed after approval and the next commencement. Walkers are expected to complete their remaining requirements within one year.

Term Honors

At the end of each term, degree students who have attained term GPAs of 3.50 or 4.00 while carrying 12 or more letter-graded credit hours and who have not received a failing or incomplete grade in any subject during that semester are accorded Dean's List honors or President's List honors, respectively. Full-time nursing students are eligible for term honors while enrolled in a non-graded clinical course.

Honor Societies

Vermont Tech students may qualify for membership in the following national honor societies:

Alpha Delta Nu is a national honor society formed by the Organization for Associate Degree Nursing to recognize the academic excellence of students in the study of Associate Degree Nursing. The society shall encourage the pursuit of advance degrees in the profession of nursing as well as continuing education as a lifelong professional responsibility. Additionally, the Society shall participate in the recruitment of qualified individuals into the nursing profession.

Requirements for candidacy are:

- 3.00 or above in nursing courses (with letter grades of *B* or higher) and a cumulative GPA of 3.00 or above and no previous failures in any Nursing course
- Sophomore status
- Students shall have demonstrated conduct on campus and the clinical areas that reflects integrity and professionalism as determined by the Nursing faculty advisors

Lambda Beta is the national honor society for the profession of respiratory care. It was formed in 1986 to promote, recognize, and honor scholarship, scholarly achievement, service, and character of students, graduates, and faculty members of the profession.

Requirements for candidacy are:

- Completion of 50% of the respiratory care courses
- GPA which ranks in the top 25 percent of the Respiratory Therapy class

Phi Theta Kappa is a national honor society formed to recognize and encourage scholarship, academic excellence, leadership, and service among two-year college students.

Requirements for candidacy are:

- 3.50 cumulative GPA with no incomplete grades
- Working toward a VTC degree with a minimum of 12 credits completed at Vermont Tech

Sigma Phi Alpha is the national honor society for dental hygiene students. It was formed to recognize, promote, and honor outstanding scholarship, service, and character among students or graduates of dental hygiene schools in the U.S. and Canada. Second year dental hygiene students who rank highest in scholarship and character and who exhibit potential for future growth are, upon recommendation of the full-time Dental Hygiene faculty, elected to this prestigious group. Membership is limited to ten percent of the graduating class.

Tau Alpha Pi is the national honor society for associate and baccalaureate degree students in engineering technology. Its purpose is to recognize academic excellence in fields of engineering technology study and to encourage a lifetime commitment to learning and scholarship.

Requirements for candidacy are:

- Cumulative GPA of 3.50 with no incomplete grades
- Minimum of 24 credits completed at Vermont Tech while in an engineering technology program

Engineering technology students with more than 48 credits may be considered with a 3.30 or better cumulative GPA.

Graduation Honors

To be eligible for graduation honors, a degree student must:

- Have a minimum of 30 credits for an associate degree, a minimum of 60 credits for a bachelor's degree completed within the VSC
- Have achieved the following cumulative GPA for all coursework:

Cum Laude	3.50
Magna Cum Laude	3.70
Summa Cum Laude	3.90

A student in the final two years of a 2+2 degree program may petition to receive graduation honors provided they have earned a minimum of 30 graded credits at the VSC.

To be eligible for graduation honors, a certificate student must:

- Complete 50% of the degree requirements at Vermont Tech
- Have achieved the following cumulative GPA for all coursework:

Honors	3.00
High Honors	3.50

Awards

Each year, a number of students receive awards for distinguished performance, noteworthy improvement, and/or superior service and dedication to the college. A student who fulfills the requirements for two degrees is eligible for awards in both majors. Full-time students who are degree candidates are eligible for these awards:

- The *American Society of Civil Engineers Award* is given to the graduating student with the highest academic average and greatest all-around academic development in the Civil & Environmental Engineering Technology program
- The *American Society of Heating, Refrigeration, and Air-Conditioning Engineers Award*, sponsored by the Champlain Valley Chapter, is given to a deserving senior who is graduating from the Bachelor of Science in Architectural Engineering Technology program. The award is based on factors such as participation in student and parent chapter activities and interest and excellence in building mechanical engineering systems. This award is given most years, but not every year
- The *Angus A. Murray Athletic Award* is given to an individual who demonstrates selfless dedication to the college's athletic program
- The *Angus A. Murray Award for Excellence in Writing* is given to a returning student who demonstrates the greatest overall excellence in writing in Vermont Tech's two required English courses
- The *BSN Nurse Leadership Award* is given to a graduate of the Bachelor of Science in Nursing program who has exemplified the leadership qualities sought after and valued in today's BSN graduates. The recipient has displayed excellence in nursing through scholastic achievement; participation on committees; service to the college; community and social advocacy; role modeling, and promoting academic progression for nurses
- The *Business Technology & Management Faculty Award* is given to the graduating student with the highest academic average and greatest all-around academic development in this program
- The *Colgate STAR Award* is offered to the graduating dental hygiene student who shows excellence and commitment to the hygiene profession by demonstrating true dedication to the profession; exhibiting extraordinary compassion in patient care; displaying enthusiasm and follow-through for community service; and demonstrating outstanding patient education and motivation skills
- The *Computer Engineering Technology Award* is given to the graduating student with the highest academic average and greatest all-around academic development in this program
- The *Dental Hygiene Peer Recognition Award* is given to a graduating dental hygiene student who, in the opinion of classmates, exhibits the interest, attitude, and cooperative spirit desirable in a dental hygienist
- The *Dorothy Wootton Outstanding Clinician Award* is given by the faculty of the department of Dental Hygiene to the graduating student who best demonstrates outstanding clinical performance
- The *Edward F. Kibby Memorial Award* is given to the athlete who has displayed the most outstanding sportsmanship throughout the year from the Vermont Tech Alumni Association.
- The *Edward H. Jones Testimonial Fund Award* is given to the graduating student who

has shown the greatest all-around academic development in an agricultural technology program

- The *Equine Studies Faculty Award* is given to the graduating student with the highest academic average and greatest all-around academic development in this program
- The *Faculty Award* is given to the graduating student who has made the greatest contribution to student activities while attending Vermont Tech
- The *J. Edward Marceau Memorial Scholarship Award* is given to one graduating Dental Hygiene student who is a Vermont resident and plans to practice in Vermont for at least one full year and, in the opinion of the faculty, exhibits outstanding scholastic achievement and community involvement
- The *Landscape Development & Sustainable Horticulture Faculty Award* is given to the graduating student with the highest academic average and greatest all-around academic development in this program
- The *Mechanical Engineering Technology Award* is given to a graduating student who demonstrates exemplary character, commitment, and effort in their studies
- The *Nursing Program Award* is given to graduates of the Associate Degree in Nursing program from the Vermont State Nurses Association for clinical excellence and from the VTC Nursing program for academic excellence
- The *Outstanding Community Service Leader Award* recognizes one outstanding student for their contributions to the community. It may be awarded to a student participating in the Community Outreach Team or America Reads program or to a student who has completed a specified number of community service hours
- The *Outstanding Student in Professional Pilot Technology Award* is given to a graduating student in the Professional Pilot Technology Program who is selected based on their outstanding academic achievement; demonstrated leadership skills, especially applicable to the high standards of a future airline captain; willingness to do outreach for the program and the community; and who exemplifies scholarly commitment to lifelong learning as a professional pilot in a global air transport world
- The Practical Nursing program recognizes clinical excellence through academic awards that are specific to the individual PN nursing regions. Graduation awards are given in the Southwest, Southeast, Central, Northwest, and Northeast Kingdom regions
- The *Rena Katz Chernick Memorial Scholarship Award* is given by the Vermont Dental Hygienists' Association in memory of Ms. Chernick, who was a very dedicated, enthusiastic, and active dental hygienist on the state, regional, and national levels. The award is given to the graduating student who exhibits outstanding scholastic achievement
- The *Respiratory Therapy Clinical Excellence Award* is given to the graduating student who, in the opinion of the clinical faculty, demonstrated the professional ideals of competence, integrity, leadership, collaboration, advocacy, and accountability throughout their clinical education experiences
- The *Robert S. Brady Award* is given to the sophomore student who has shown the greatest all-around academic achievement in the Architectural & Building Engineering Technology program. The award is given from the Hanne Williams fund by the Vermont Chapter of the American Institute of Architects
- The *Ruth Freeman Award* is given to the student in the Architectural & Building Engineering Technology program whose work in ARE 2050 has exhibited architectural design excellence. The award is given from the Hanne Williams fund by the Vermont Chapter of the American Institute of Architects
- The *Rutland County Alumni Award* is given to a graduating student who is a Rutland County resident with the highest academic average
- The *Sigma Phi Alpha Board Award Scholarship* is given by the Sigma Alpha Dental Hygiene Honor Society to one or two graduating dental hygiene students with outstanding

achievement in academics, as well as community service and with financial need

- The *Society of Manufacturing Engineers Award* is given to a graduating student in the Mechanical Engineering Technology department who exhibits outstanding professionalism, proficiency, and dedication
- The *Stanley G. Judd Memorial Fund Award* is given to the graduating student with the highest academic average in an agricultural technology program from the Vermont Tech Alumni Association
- The *State of Vermont Agency of Transportation: Aviation Recognition Award* is given to a student in recognition of dedication, accomplishment, and contribution to general aviation in the state of Vermont
- The *Student Engineering Technician of the Year Award* is given to a student completing the second year in an associate or bachelor's degree program in engineering technology who is selected from nominations by the engineering technology departments for outstanding scholarship, character, and leadership
- The *Student Engineer of the Year Award* is given to a student completing the final year in a bachelor's degree program in engineering technology who is selected from nominations by the engineering technology departments for outstanding scholarship, character, and leadership
- The *VTC Fire Science Special Recognition Award* is awarded to the Vermont Tech Fire Science student(s) whose combined academic achievement, leadership, and service to the program and to the college deserves special recognition
- The *Vermont Association of Professional Horticulturists Student Award* is given to a second-year student in the Landscape Design & Sustainable Horticulture program who exemplifies the qualities of a professional in the field: motivation, direction, leadership, and respect for both humans and the natural environment. The recipient must have earned at least 30 credits and hold a GPA of 3.0 or greater
- The *Vermont Automobile Dealers Association Award* is given to the graduating student with the greatest all-around academic development in the Automotive Technology program
- The *Vermont Automobile Enthusiasts Award* is presented to the graduating senior in the Automotive Technology program who exhibits the greatest appreciation of automobiles
- The *Vermont Dental Hygienists Association Membership Spirit Award* is given to a graduating Dental Hygiene student who exhibits a high level of professional pride and enthusiasm for the profession of dental hygiene
- The *Vermont Flight Academy Professional Pilot Excellence Award* is given to a student who has consistently demonstrated the outstanding personal qualities and skills necessary for a successful career in aviation and, during years of training at VFA, has developed the highest standards under the following criteria: technical knowledge, risk management, aeronautical decision-making, communication, airmanship, ability to follow standard operating procedures, preparedness for flight lessons, and punctuality
- The *Vermont Tech Faculty Memorial Fund Scholarship* is given to a student who has completed the freshman year and whose outstanding scholarship exemplifies excellence in technology. This award was created by the faculty as a memorial to the men and women who served on the faculty and have passed away
- The *W. Newton Ryerson Award for Excellence in Freshman Mathematics & Physics* is given to a returning student with a GPA of 3.5 or higher in freshman mathematics and physics courses who demonstrates excellence in lab performance and a positive general attitude as shown by class and lab participation or by assisting other students
- *Who's Who Among Students at American Junior Colleges:* each department nominates students for this honor given for academic achievement, community service, leadership in extracurricular activities, and potential for success

Honesty & Ethics

Vermont Tech expects high standards of truthfulness and honesty in all academic work. Any student who is found guilty of academic dishonesty faces disciplinary action, up to and including dismissal from the college. Cheating refers to plagiarizing or using unauthorized aids or copying another person's work on exams, quizzes, or assignments.

Center for Academic Success

The staff and programs at the Center for Academic Success (CAS) provide students with assistance to reach their full potential and be successful while attending Vermont Tech. The support provided includes peer mentoring for first-semester students; tutoring; short-term counseling and goal-setting; study and test taking assistance; and financial literacy information and assistance, all of which are necessary for students to meet academic, personal, and career goals. The SSS/TRiO program and Services for Students with Disabilities are also housed at the CAS. The main office is on the Randolph Campus, with staffing provided at the Williston campus. Students enrolled at other sites can contact their site coordinator or the main CAS office to arrange for services which are delivered via phone, Adobe Connect, or in person.

Academic Counseling
Academic counseling includes a variety of services designed to help students with issues that may interfere with attaining their academic goals. Counselors provide informal academic assessments; academic and vocational counseling; help with managing stress, anxiety, and personal issues; and help with study skills and learning style.

Assistive Technology
The CAS provides access to assistive technology software and hardware designed to help students with scanning, editing, or dictating documents; having documents read aloud by the computer for editing or test-taking; and developing or organizing information.

Career Development Center
The Career Development Counselor provides assistance with career and college transfer decision-making, individual assistance, and workshops on writing resumes.

ESOL
ESOL tutors may be available to help students with reading, writing, class-specific vocabulary, and pronunciation. There is also software available for students to practice ESOL skills. All tutoring services are free of charge.

Services for Students with Disabilities
Students with disabilities are encouraged to meet with the Learning Specialist to explore their options and determine their eligibility for accommodations. Interviews and phone calls to address particular concerns are welcome at any time during the admission process or after enrollment at the college. All information regarding disability is kept in strict confidence and never becomes a part of the student's academic record. Accommodations are always determined individually on a case-by-case basis. Available services include: academic counseling, student support group, classroom accommodations, training in the use of assistive technology, and assistance in obtaining auxiliary aids.

Student Support Services/TRiO Program
The SSS/TRiO Program at Vermont Tech provides support services designed to increase student retention and graduation. Funded by a special grant from the U.S. Department of Education, SSS/TRiO provides services to first-generation college students, low-income students, and students with disabilities. This program is widely used by students for academic and career counseling; assistance in transferring to associate and bachelor's degree programs; improving study skills; developing reading and writing skills; individual tutoring; workshops; peer advising; support groups; information on financial literacy; and help with financial aid forms and issues.

Support & Counseling
The CAS focuses on wellness for emotional and mental health. The center offers peer and professional mentoring on issues such as stress, adjusting to college, test anxiety, and other issues related to student wellness. The center also offers referrals to licensed mental health professionals on campus when appropriate. Students with specific mental health concerns may work with the

counselor at the CAS to connect with licensed therapists on campus or with locating community treatment resources.

Tutoring Services
The CAS provides individual or small group tutoring for most first-year classes and many specialized upper-level classes. Each student is allowed one hour per subject per week. Additionally, students can access any or all of the drop-in tutoring sessions on the Randolph or Williston campuses. Drop-in sessions are for all math classes and many science classes. Writing for research, labs, or reports sessions are available as well. Prior to the final exam period, test review sessions are scheduled for most math classes and some science classes. All tutoring services are free of charge. Services are available to any student hoping to do better in terms of grades or comprehension of content.

Hartness Library

Hartness Library supports the curricular and research needs of Vermont Technical College and the Community College of Vermont through the provision of information resources, services, and instruction. Located in the heart of the Randolph Center campus, the library provides a comfortable and welcoming place to study, learn, and gather with friends to work in collaboration. The library has study and meeting rooms and computers, printers, and scanners available for the campus community to use. A satellite location on the Williston campus is staffed by a librarian and offers the same services as the main library. Hartness also provides access to all library resources and services online, ensuring that all students, whether online, on campus, at a distance site, or at a CCV academic center can use the library. To access our resources and services, visit our website at http://hartness.vsc.edu/vtc

Collection
The collection is developed with input from our faculty to ensure that we are supporting our students and the curriculum effectively. The library collection includes over 42,000 books; 200,000 ebooks; 25,000 streamed films and documentaries; 6,000 videos and DVDs; 58,000 full-text online periodical titles; and course reserve materials. Students have 24-hour access to the library's extensive online resources from anywhere through the library's website using any computer or mobile device. Our free interlibrary service is available to request books or journal articles which the library does not own.

Reference Services
The staff and professional librarians offer students support in finding and evaluating resources for their research. Librarians and staff are available to help students face-to-face, using our 800 number, via live online chat, text message, or by email. Librarians may also be embedded in classes to serve online students and VTC's distance sites and campuses. The library provides an online library orientation, video tutorials, a research basics guide, and librarian-created subject guides to help familiarize students with library resources and services.

Information Literacy
The library supports students in meeting the Vermont State Colleges information literacy graduation standard. Librarians visit classes for face-to-face library orientation and information literacy instruction early in the semester.

Public Notice Designating Directory Information

Directory information is information which would not generally be considered harmful if disclosed. It includes the following: name; home and college addresses; telephone listing; mailing address; date of birth; major; enrollment status (full-time or part-time); dates of attendance; awards received; weight and height of athletic team members; photographs; most recent and previous educational institutions attended; and participation in officially recognized activities and sports.

Currently enrolled students may withhold disclosure of personally identifiable, directory-type information under the Family Educational Rights and Privacy Act (FERPA). To withhold disclosure, written notification must be received by the Office of the Registrar. Forms requesting the withholding of directory information are available. Vermont Tech assumes that failure on the part of any student to specifically request the withholding of directory information indicates individual approval for disclosure.

Student Records Review, Release, & Right-to-Know
Vermont Tech informs students of FERPA annually. This act was designated to protect the privacy of educational records; to establish the right of students to inspect and review their educational records; and to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings. Students also have the right to file complaints with the FERPA Office concerning alleged failures by the institution to comply with the act.

The college has a policy of disclosing educational records to Vermont Tech and VSC officials with a legitimate educational interest without prior consent. Questions concerning FERPA may be referred to the Office of the Registrar.

VSC Enrollment Consortium Agreement

By agreement of the Vermont State Colleges, students enrolled at any VSC institution may simultaneously enroll in courses at other VSC institutions and receive full credit for those courses at their home institution. This agreement eliminates duplication of registration or other enrollment fees and students receive financial aid based upon their total credit enrollment within the VSC. Course-specific fees of $100 or more are reimbursed by the student to the institution where those fees are incurred.

Students seeking to benefit by this agreement must ensure that coursework meets program requirements at the home institution prior to enrolling at the other VSC institution. Registration for courses at other VSC institutions is through the home institution. The school-specific policies and procedures regarding degree requirements, transfer credits, placement levels, refund policies, and add/drop/withdraw dates and procedures that pertain to each student are those of the home institution. When registering, it is important that students receive information and advising based on their own school's policies and procedures. Therefore, students register at their home institutions (or online via Web Services, with home institution approval) for all courses to be taken within the VSC, regardless of where the course is taken.

Students enrolled in the LPN program are not eligible for the VSC enrollment consortium because of the divergent calendar of that program.

A student who wants to enroll exclusively at another VSC school other than their home institution may do so for a maximum of two terms. To be eligible, the student must be matriculated at the home institution and must secure written permission in advance of their enrollment from the home institution.

Courses taken at any VSC institution are included in GPA calculations at the home institution.

Tuition & Fees 2017-2018

Estimated Costs of Attendance

Students are responsible for familiarizing themselves with the cost descriptions; payment and refund policies; and the definition of residency for tuition payment purposes as detailed below. In the following cost charts, all charges are based on full-time enrollment (12-19 credits per semester) and are subject to change.

Cost Chart One: Fall & Spring Terms

All undergraduate programs except Aviation, Dental Hygiene, Nursing, & Paramedicine

	Vermont	Residents	Non-VT	Residents	RSP/NEBHE	Program
	Term	*Year*	*Term*	*Year*	*Term*	*Year*
Tuition	$6,756	$13,512	$12,912	$25,824	$10,140	$20,280
Double Room	3,064	6,128	3,064	6,128	3,064	6,128
Meal Plan (Gold)****	2,081	4,162	2,081	4,162	2,081	4,162
Facilities Fee	410	820	410	820	410	820
Matriculation Fee*	390	390	390	390	390	390
Student Activity Fee	139	278	139	278	139	278
Student Security Fee	40	80	40	80	40	80
Health Insurance**	--	2,328	--	2,328	--	2,328
Total	**$12,880**	**$27,698**	**$19,036**	**$40,010**	**$16,264**	**$34,466**

Cost Chart Two: Nursing

		ADN 2 Semesters			PN 3 Semesters	
	Vermont Residents	**Non-VT Residents**	**RSP/NEBHE**	**Vermont Residents**	**Non-VT Residents**	**RSP/NEBHE**
Tuition	$14,184	$29,928	$21,288	$19,503	$41,151	$29,271
Double Room Meal Plan (Gold)****	10,290	10,290	10,290	13,720	13,720	13,720
Facilities Fee	820	820	820	1,135	1,135	1,135
Matriculation Fee*	390	390	390	390	390	390
Student Activity Fee	278	278	278	386	386	386
Graduation/Audit Fee	98	98	98	98	98	98
Student Security Fee	80	80	80	120	120	120
Health Insurance**	2,328	2,328	2,328	2,328	2,328	2,328
Total	**$28,468**	**$44,212**	**$35,572**	**$37,680**	**$59,328**	**$47,448**

For further information concerning estimated costs of attendance for the Nursing programs, contact the Business Office at (802) 728-1301. Program costs are based on annual full-time cost of the program.

Cost Chart Three: Dental Hygiene

	Vermont	Residents	Non-VT	Residents	RSP/NEBHE	Program
	Term	*Year*	*Term*	*Year*	*Term*	*Year*
Tuition	$8,460	$16,920	$13,224	$26,448	$12,696	$25,392
Williston Double Room†	3,064	6,128	3,064	6,128	3,064	6,128
Facilities Fee	410	820	410	820	410	820
Matriculation Fee*	390	390	390	390	390	390
Student Activity Fee	139	278	139	278	139	278

	Vermont	Residents	Non-VT	Residents	RSP/NEBHE	Program
	Term	*Year*	*Term*	*Year*	*Term*	*Year*
Student Security Fee	40	80	40	80	40	80
Health Insurance**	--	2,328	--	2,328	--	2,328
Total	**$12,503**	**$26,944**	**$17,267**	**$36,472**	**$16,739**	**$35,416**

Cost Chart Four: International Students

	Undergraduate	ADN	LPN	Dental Hygiene	Paramedicine	Graduate
Tuition	$29,688	$33,792	$46,464	$30,312	$50,688	$27,828
Double Room	6,128	6,128	8,171	6,128	8,171	6,128
Board (Gold plan)***	4,162	4,162	5,549	--	--	--
Student Activity Fee	278	278	386	278	417	278
Facilities Fee	820	820	1,135	820	1,230	820
Matriculation Fee*	390	390	390	390	390	390
Student Security Fee	80	80	120	80	120	80
Health Insurance**	2,328	2,328	2,328	2,328	2,328	2,328
Total	**$43,874**	**$47,978**	**$64,543**	**$40,336**	**$63,344**	**$37,852**

Cost Chart Five: Paramedicine (3 semesters)

	VT Residents	Non-VT Residents	RSP/NEBHE
Tuition	$21,276	$44,892	$31,932
Williston Double Room†	8,171	8,171	8,171
Student Activity Fee	417	417	417
Facilities Fee	1,230	1,230	1,230
Matriculation Fee*	390	390	390
Graduation/Audit Fee	98	98	98
Student Security Fee	120	120	120
Health Insurance**	2,328	2,328	2,328
Total	**$34,030**	**$57,646**	**$44,686**

Cost Chart Six: Graduate (Costs shown at 9 credits)

	Vermont	Residents	Non-VT	Residents	RSP/NEBHE	Program
	Term	*Year*	*Term*	*Year*	*Term*	*Year*
Tuition	$6,336	$12,672	$12,114	$24,228	$9,504	$19,008
Williston Double Room†	3,064	6,128	3,064	6,128	3,064	6,128
Student Activity Fee	139	278	139	278	139	278
Facilities Fee	410	820	410	820	410	820
Matriculation Fee*	390	390	390	390	390	390
Student Security Fee	40	80	40	80	40	80
Health Insurance**	--	2,328	--	2,328	--	2,328
Total	**$10,379**	**$22,696**	**$16,157**	**$34,252**	**$13,547**	**$29,032**

Cost Chart Seven: Online Degree Students

	Vermont Residents	Non-VT Residents
Tuition (per credit)	$563	$563
Online Fee (per semester)	$236	$236
Matriculation Fee*	390	390
Student Security Fee	20	20

†Williston based on availability
**Applies to all new matriculated students*
***Required if not covered by another medical plan; you must be a full-time degree-seeking student to obtain coverage. $2,328 is the annual rate for all fall semester students; cost is subject to change*
****Meal charges for Randolph Center campus and Gold Plan; no meal plans at Williston campus*

Cost Chart Eight: Professional Pilot Technology

In addition to tuition and other fees, the Professional Pilot Technology program requires flight fees specific to mandated flight courses with flight time in the aircraft and flight simulators for each of the FAA certificates and ratings.

Flight fees are applied to individual flight courses and are charged for the semester that each flight course is taken. The fees outlined below are based on the number of hours the average student takes to complete each course. Additional flight time may be required due to a host of variables, including individual learning style, personal commitment, illness, or weather conditions. Any additional ground or flight instruction required is billed on an hourly basis until successful completion is reached.

A full syllabus for all ground and flight courses, on campus or at the airport, are available as a handout and are posted on both the Vermont Tech and the Vermont Flight Academy websites. This includes pre-flight, post-flight briefing topics, and maneuvers and procedures for simulator instruction and airplane flying for all courses.

If a student chooses not to take the two Multi-Engine ratings and the two additional Certified Flight Instructor ratings (Instrument and Multi-Engine), they may take an appropriate 3 credit elective to replace the four courses with a total of 3 credits and not obtain the last 4 ratings during the junior or senior year.

Flight Fees

Course	Flight Training	Flight Fees	Flight Hours	Credits
AER 1020	**Private**	$12,655	55	2
AER 1120	**Instrument**	12,334	52	2
AER 2031	**Commercial I**	17,923	85	2
AER 2032	**Commercial II**	8,909	35	2
AER 3020	**CFI: Airplane**	6,723	25	2
AER 4010	**Multi-Engine: Land**	5,374	10	0.5
AER 4011	**Multi-Engine: Sea**	4,968	7.5	0.5
AER 4020	**CFI: Instrument**	4,883	15	1
AER 4030	**CFI: Multi-Engine**	11,374	25	1

All required courses for the BS degree must use full flight hours.

All courses commence as 141 with an enrollment certificate. If sufficient training is received to complete the FAA check-ride with fewer hours, students can be dropped as 141 students and receive an FAA Part 61 check-ride to complete. When this occurs, excess funding must be returned to the VA or the student's account after financial scrutiny of fewer hours flight training.

FAA Medical Examination

A FAA 1st Class Medical Exam must be completed by an authorized Aviation Medical Examiner and a copy submitted to the aviation program director or the Office of Admissions by June 1 to be admitted to the program. Estimated medical expense is $150. A $50 urine drug screening is also required; students may not need any additional medical during the degree program.

FAA Written Exam Fees

A total of six FAA exams are required for certifications and ratings during the four-year program.

Each exam costs $150 and is taken at a Laser Grade Testing Center, as required by the FAA. Vermont Flight Academy operates a full Laser Grade Testing Center at the flight school.

FAA Examiner Fees
FAA certifications and ratings require the successful completion of written and flight exams. The flight exams must be given by an FAA Designated Pilot Examiner. Before each flight, FAA Examiner Fees are paid directly to the examiner at the time of their Oral and Flight Test for each certificate and rating. Fees vary from $300-680 per check ride depending on the certificate or rating.

Pilot Equipment
Students require: headsets; Federal Aviation Regulations; aviation charts; plotters; E6-B flight computers; aircraft syllabus/course books; flight logbook; oral and practical test prep guides; FAA Practical Test Standards for each course; etc. A list of all required materials is handed out and posted on the website. Textbooks for non-flight aviation courses are not included. Estimated cost for the four-year program is $1,700 - 2,000.

Insurance
Vermont Flight Academy carries liability and physical damage (hull) insurance. VFA extends limited liability coverage to students. However, students are responsible for the insurance deductible (in the event of a loss). It is mandatory for each student to purchase an individual non-owner policy for $314 per year. This provides student liability protection for legal defense; deductible and loss of use; and subrogation.

Appropriate Dress
Aviation is a profession. Students are expected to dress appropriately in ground and flight classes at all times. During flight training at the airport, dress appropriately for the season in which you are operating.

iPhones & iPads
These devices are widely used in aviation and recommended with multiple apps to assist pilots with convenient access to weather, navigation, approach charts, and regulations.

Other Estimated Expenses per Year (*All* Cost Charts)

Books, transportation, personal needs	$4,650
Automotive student tools	2,400
Dental clinic attire, uniforms, shoes (1st year)	1,400
Dental instruments/lab materials (1st & 2nd year)	1,200
Dental exams & licensure (3rd year)	1,750
Equine riding arena costs	2,400
Nursing uniforms	250
Nursing lab kit (PN only)	115

Optional Room & Board Rates per Semester

Single Room	$3,881
Double Room	3,064
Triple Room	2,751
Gold Meal Plan (unlimited with 75 points at snack bar)*	2,081
Base Meal Plan (+150 points at snack bar)*	2,004
8 Meal Plan (+225 points at snack bar)*	1,927
Overnight rooms for emergencies (per night)	36

**Meal charges for Randolph Center campus; no meal plans at Williston campus*

Other Fees: All Programs

Application fee (due when applying for admission)	$47
Challenge Exam Fee (per exam)	150

Deferred Payment Fee (per term)	54
Graduation Fee	98
Late Financial Clearance Fee	130
Matriculation Fee	390
Non-degree Student Registration Fee (per semester)*	71
Returned Payment Fee	25
Portfolio Assessment	50
Student Activity Fee (per semester)	139
Student Security Fee (per semester)	40
Transcript Fee (per copy)	6.50

** Applies only to students who have not been accepted into a VTC program*

Per Credit Tuition & Fees

Degree-seeking students registered for 12 credit hours or more (except graduate students) are full-time students and expenses are set forth under cost charts One through Eight on the preceding pages. Overload status fees apply to class loads of 20 or more credit hours per semester. Overload credit hours are billed at the rates below. Degree-seeking students registered for fewer than 12 credit hours are considered part-time students and are charged on a per credit basis as indicated below. Non-degree-seeking students are charged for all credits.

Tuition

Vermont Resident	$563
Vermont Resident (Nursing & Paramedicine)	591
Vermont Resident (Dental Hygiene)	705
Vermont Resident (Graduate)	704
Non-Vermont Resident	1,076
Non-Vermont Resident (Nursing & Paramedicine)	1,247
Non-Vermont Resident (Dental Hygiene)	1,102
Non-Vermont Resident (Graduate)	1,346
RSP/NEBHE	845
RSP/NEBHE (Nursing & Paramedicine)	887
RSP/NEBHE (Dental Hygiene)	1,058
RSP/NEBHE (Graduate)	1,056
International	1,237
International (Nursing & Paramedicine)	1,408
International (Dental Hygiene)	1,263
International (Graduate)	1,546

(RSP/NEBHE/GN cost shown as money due after NEBHE credit is applied)

Fees

Student Activity Fee* (per credit hour, max. 11 credits)	$12
Non-degree Student Registration Fee (per semester)	71
Facilities Fee* (per credit hour, max. 11 credits)	35

**All Matriculated Students*

Summer Costs

Vermont Resident	$563
Vermont Resident (Nursing & Paramedicine)	591

Vermont Resident (Dental Hygiene)	705
Vermont Resident (Graduate)	704
Non-Vermont Resident	845
Non-Vermont Resident (Nursing & Paramedicine)	887
Non-Vermont Resident (Dental Hygiene)	1,058
Non-Vermont Resident (Graduate)	1,056
RSP/NEBHE	845
RSP/NEBHE (Nursing & Paramedicine)	887
RSP/NEBHE (Dental Hygiene)	1,058
RSP/NEBHE (Graduate)	1,056
International	1,237
International (Nursing & Paramedicine)	1,408
International (Dental Hygiene)	1,263
International (Graduate)	1,056

There is no financial aid for summer term; payment in full is expected by the start of summer classes.

Senior Citizen Discount

Any student aged 65 years or older may audit one VSC course per enrollment period without tuition charge. Additional courses may be taken without limitation, up to and including completion of a certificate or undergraduate degree, at the rate of 50% of the charged tuition. To be eligible, such persons may not take the place of full tuition-paying students in courses with enrollment limits. Course-specific fees, including Registration fees, shall be the responsibility of the student. All other student fees are waived.

Explanation of Fees

Application Fee: $47
This fee is required when a prospective student applies for admission to the college.

Board
Students on the Randolph Center campus may choose from three meal plans. The *Gold Plan* offers unlimited meals with $75 per year in debit points for the snack bar. The *Base Plan* offers 12 meals per week with $150 per year in debit points. The *8 Meal Plan* offers 8 meals per week with $225 per year in debit points. Each meal plan also comes with 6 guest meals per semester.

Challenge Exam Fee: $150 per exam
This fee is required when students take challenge exams for college credit or advanced standing.

College Safety & Security Fee: $40 per semester
This fee is used to enhance safety and security and to ensure a safe and healthy learning environment. The fee is charged to all matriculated students.

Course Fee
This fee is required to offset the cost of special projects or equipment for specific courses.

Deferred Payment Fee: $54 per semester
This fee is charged to students who request that payment of semester charges be deferred because an outside source (employer, VA benefits, etc.) is providing payment directly to Vermont Tech past the normal due date.

Facilities Fee: up to $410 per semester
This fee is charged per semester to all matriculated students. Full-time equivalent students (12 credits or more) are charged per semester. The fee is pro-rated per credit hour for part-time students. Funds raised by the fee support the development of new facilities on the Randolph Center and Williston campuses. In billing, the fee is referred to as *VTC Facilities Fee*.

Graduation Fee: $98
All graduating students are charged a fee prior to graduation and must pay the fee whether they are participating in the ceremony or not. The fee is charged per degree.

Health Insurance Fee: $2,328 per year
Health insurance is mandatory for all full-time students not otherwise covered. A student (or their parents) must present written proof certifying that they are covered to be exempted from the college insurance fee. An online Student Waiver form for the VSC Student Health Insurance Plan must be completed by all full-time students. This form can be found on the student menu in Web Services. Students failing to return the form by the published deadline are automatically enrolled in and billed for the VSC health plan.

Institutional Lab Fee: $64 per lab credit hour
This fee is required to offset the cost of instruction in lab and studio courses.

Late Financial Clearance Fee: $130
This fee is charged to students who have not paid or provided proof of how their current semester bill will be paid. Financial holds are activated approximately 30 days into each semester and this fee charged.

Matriculation Fee: $390
This fee applies to all matriculated students. For new students only, the incoming rate is $390. There is a one-time charge for first semester enrolled.

Online Support Fee: $236
This fee provides support infrastructure for students in the college's online programs.

Portfolio Assessment Fee: $50
This fee is for each portfolio submitted for review.

Registration Fee: $71
This fee is required of each non-degree student who enrolls in one or more courses during a semester.

Returned Payment Fee: $25
There is a service charge on any payment that is returned to the Student Accounts Office by the banking institution for insufficient funds, invalid accounts, etc. For checks that were received for cash, no future checks will be accepted.

Student Activity Fee: up to $139 per semester
This fee covers the expense of student clubs, activities, and associated costs. It also covers admission to most campus events such as concerts, dramatic productions, films, lectures, and recreational and social activities.

Transcript Fee: $6.50 per copy
This fee covers the cost of processing transcripts after the initial free copy.

Textbooks & Supplies

The college bookstore sells textbooks, supplies, equipment, calculators, and sundries. The cost of required textbooks and supplies varies depending on the program. Typically, these costs amount to approximately $700 per semester. The bookstore accepts credit cards and cash. Upon approval from the Business Office, students who have financial aid to cover college expenses plus books are eligible to charge books to their student accounts 30 days prior to the start of each semester.

Automotive Technology and Construction Management students are required to have their own tools. Contact the directors of these programs for details.

Calculators

The Vermont Tech mathematics department requires all entering students to have a contemporary graphing calculator for use in mathematics classes. For those taking MAT 1420 and MAT 1520, the mathematics faculty recommends either a TI-83 or TI-83+ *or* an HP-48 or HP-49. We highly recommend that students taking a business math or statistics course have the TI-83 or TI-83+. Although calculators may be bought at local stores, they are also available at the Vermont Tech bookstore.

Other Expenses

College students incur a variety of other expenses such as the costs of travel, social activities, and laundry. The total of these expenses is difficult to judge and can probably best be determined by each student and their family. The college estimates these costs at about $1,650 a year.

Deposits

Accepted candidates for admission to the college are required to send a $200 tuition deposit by May 1 (or within two weeks if accepted after May 1). The deposit is considered a token of a student's good faith and is applied to the first semester's tuition and fees. Students are not enrolled in classes or billed semester costs until the deposit is paid.

If a student intends to live on campus, a $100 room deposit must be sent by May 1 (or within two weeks if accepted after May 1) and must accompany an applicant's completed Room and Board Contract. For returning students, the $100 room deposit is due in early April. Deposits are non-refundable except for a returning student's room deposit if a refund is requested prior to May 1.

Housing deposits are placed in a holding account until the end of the spring semester, at which time they are placed on students' accounts and go toward any dorm damage fines that may be incurred for the academic year. Any amount not used for damage is refunded to the student at the end of May if no other balance remains on the student's account. If a balance remains, the deposit is applied to the balance.

Payment Authorization

Students can authorize a parent or guardian or anyone else they choose to access, log in, view, and/or make a payment on their account via the web. Students *must* complete this process, as Student Accounts staff must know who has permission for account reviews when calls or emails are received from people other than the student.

Semester Payment Plans

Fall plans are available online at https://portal.vsc.edu beginning June 1 or when billed. Select the *VSC Bill Payment for Students and Authorized Users* link at the bottom of the page. You must have a log-in ID, a password, and a billing statement to access this service.

We offer five convenient in-house plans for fall (see http://www.vtc.edu/student-accounts for other semester plans):

- Six payments from June through November
- Five payments from July through November
- Four payments from August through November
- Three payments from September through November
- Two payments from October through November

There is a $30 enrollment fee and a down-payment required when signing up based on the option chosen. Monthly payments are due on the fifteenth of each month and a $15 late fee is incurred for payments not made by the due date. Semester balances *must be paid in full* prior to enrolling in future semesters. A new payment plan must be set up each semester.

As a condition of enrollment, students must provide payment in full or proof of how all semester charges will be paid within 30 days of billing. Fall billing begins on June 1.

Veterans who are certified as eligible for the GI Educational Assistance allowance are permitted to register upon signing an approved payment plan with the business office.

Employer and scholarship payments requiring final grades can be deferred.

Financial delinquency may serve as a basis for dismissal. Financially delinquent students are denied enrollment for the succeeding semester; issuance of grades or transcripts; or graduation. Reasonable interest and collection costs may be added to delinquent accounts.

Tuition, Fees, & Room & Board Refunds

If students withdraw or are dismissed before the 60% point of the term, they are credited tuition, the student activities fee, and room and board on a prorated basis. The date of withdrawal or dismissal is determined by the Office of the Registrar. The prorated calculation uses the number of calendar days completed divided by the number of total calendar days included for the full term.

Financial Aid Refunds

If a student is receiving financial aid and is eligible for credit in accordance with the above paragraph, the credit received is first applied to financial aid sources. Federal regulations are used for return of Title IV funds and individual state, college, or outside scholarship policies for return of non-Title IV funds. Because financial aid funds must be used for educational expenses, when a student who is receiving financial aid for non-institutional costs withdraws from the college, a portion of this aid must be repaid. The order of distribution for the return of Title IV funds is as follows:

1. Unsubsidized FFEL/Direct Stafford Loan
2. Subsidized FFEL/Direct Stafford Loan
3. Perkins Loan
4. FFEL/Direct PLUS Loan
5. Pell Grant
6. FSEOG
7. Other Title IV programs

Other Credits

Board charges are credited for each full week of extended illness or authorized absence. There is no credit of room charges for students suspended or dismissed from on-campus housing.

Financial Aid

Financial aid at Vermont Tech is based on the assumption that a student's family will make the maximum effort to finance college expenses. Since there are many more demands on Vermont Tech's financial aid resources than the college can possibly meet, assistance has to be viewed only as supplemental to this family obligation.

All federal funds at Vermont Tech are awarded on the basis of financial need. All students who apply for financial aid by the March 1 priority deadline and who are eligible for assistance are offered financial aid, subject to availability of funds. The amount of any award is determined by the amount of student need as computed from information provided by the family on the Free Application for Federal Student Aid (FAFSA). Federal regulations mandate that a needs analysis be completed for anyone who applies for federal financial aid. It is important to file the FAFSA as early as possible to avoid delays in processing loan applications and other forms of campus-based aid. After March 1, late applicants are considered for aid only after all on-time applications have been processed.

Applicants can expect that a fair portion of an individual's personal savings at the time of each year's application will be applied to college expenses.

Students selected for verification are required to submit additional information and are sent a tracking letter accordingly. The Office of Financial Aid uses imaging to maintain and track documentation sent to the office and all originals are shredded.

All FAFSA on the Web applicants and parents of dependent applicants who indicate that they *have filed* or *will file* a federal tax return are directed to use the IRS Data Retrieval Tool to report and/or update their income information on the FAFSA. This tool is accessible at www.fafsa.gov.

Expected Family Contribution

The needs analysis system evaluates the information requested and determines a reasonable contribution to be expected from parents and the student towards educational expenses. Unless there are extenuating circumstances, the Office of Financial Aid is required to use this expected family contribution in determining a student's need for aid. If family financial circumstances change significantly after filing the FAFSA (due to loss of employment, extended illness, disability, etc.), the family should write to the Financial Aid office as soon as possible outlining this change.

For the purpose of application, income is defined as wages, salary, tips, interest accrued, dividends, pensions, welfare, social security, or any other form of income. Deductions against income are made for taxes and there is an employment allowance for parents working outside the home, as well as an income protection allowance that is based upon family size and the total number of family members in college.

Sources of Financial Aid

When a you file a FAFSA, you are applying for the following federal, campus-based, and state aid programs and establishing eligibility for a Federal Stafford Loan.

Federal

The *Federal Pell Grant Program* is an entitlement program. This means that all eligible students receive awards. Eligibility is determined by the family's, as well as the student's, financial resources.

*Federal Stafford Loans (*both subsidized and unsubsidized) are available to qualified students at Vermont Tech. A subsidized loan is awarded on the basis of financial need. If qualified for a subsidized loan, the federal government pays interest on the loan until the student begins repayment and during authorized periods of deferment. The student pays the interest on the unsubsidized loan while enrolled on at least a half-time basis.

If you're a dependent undergraduate student, you can borrow up to:

- $3,500 if you're a first-year student enrolled in a program of study that is at least a full academic year
- $4,500 if you've completed your first year of study and the remainder of your program is at least a full academic year
- $5,500 a year if you've completed two years of study, are matriculated in a bachelor's

degree program, and the remainder of your program is at least a full academic year

Additional unsubsidized Stafford loan limits may be increased by $2,000 for loans first disbursed after July 1, 2008.

Independent undergraduate students may borrow an additional amount of money up to $4,000 or $5,000 a year, depending on their year of study. However, through the unsubsidized loan program students can't borrow more than the cost of attendance minus any other financial aid for which they are eligible.

Both the subsidized and unsubsidized loan eligibility amounts are outlined on a student's award letter.

All Stafford and PLUS loans are processed through the William D. Ford/Federal Direct Loans Program (Direct Loans). Direct Loans provides Stafford and Parent PLUS loans to parents of dependent undergraduate students through the school, funded directly by the government.

PLUS Loans enable parents with good credit histories to borrow for each child who is enrolled at least half-time and is a dependent student. Parents who wish to apply must fill out a PLUS Loan Request Form, which is available through the financial aid office. A request form is automatically mailed with financial aid award notification letters. The yearly limit on a PLUS Loan is the cost of attendance minus any other financial aid for which a student is eligible.

150% Rule for Subsidized Loans

On July 6, 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) (Public Law 112-141) was enacted and limits a first-time borrower's eligibility for Direct Subsidized Loans to a period not to exceed 150% of the length of the borrower's education program. In the summer of 2013, final regulations were completed.

First-time borrowers on or after July 1, 2013 are subject to the provisions in this legislation. Generally speaking, a first-time borrower is one who did not have an outstanding balance of principal or interest on a Direct Loan or FFEL loan on July 1, 2013.

Stated in your entrance counseling information, the subsidized loan has slightly better terms than the unsubsidized loan. In the past, the US Department of Education has paid the interest for a subsidized loan while the student was in school attending class at least half time. If you are a first-time borrower or borrowed in the past and paid back your previous loans and you are now borrowing again, you are included in this legislation.

MAP-21 limits the time period during which you can receive Direct Subsidized loans to 150% of the standard length of the program in which you are enrolled. For example, bachelor's degree program (normally completed in four years attending full time) borrowers can only receive subsidized loans for a maximum of six years (150% x 4 = 6). The period used is reduced for less than full-time study. Once you have received direct subsidized loans for your maximum eligibility period, you may continue to receive direct unsubsidized loans and your subsidized loans may begin to accrue interest. This legislation was enacted to encourage students to obtain their degrees within a reasonable time frame.

Federal Aid Programs Administered by the College

The *Federal Supplemental Education Opportunity Grant* (FSEOG) is a gift of money to assist students with the cost of their education. It is restricted to undergraduates and does not have to be repaid. The maximum amount awarded is $4,000, depending on a student's need and the availability of funds at Vermont Tech. Average grants range from $600 to $1,600 per year. Students who are eligible for Pell grants have first consideration for this fund.

The *Federal Perkins Loan Program* is a low-interest (5%) loan made directly to eligible students by the college from federal funds received for this purpose. If qualified, a student may borrow up to $15,000 during four years of college. At Vermont Tech, average loans range from $600 to $2,000 per year.

The *Federal Work-Study Program* (*FWS*) is a federal work program administered by Vermont Tech which provides jobs for students on or off campus. Average awards range from $1,200 to $1,600 for the year, which translates to approximately 10-14 hours of work per week Students may also use FWS funds for off-campus non-profit community service placements. Federal Work-Study earnings are not credited on a student's bill. Instead, a student worker receives a paycheck every two weeks.

State

Vermont Incentive Grants are awarded on the basis of financial need. Any full-time undergraduate Vermont resident who plans to attend or is enrolled in an approved post-secondary institution and who has not already received a bachelor's degree is eligible to apply.

Students are required to file supplemental information to the Vermont Student Assistance Corporation (VSAC) to be considered for a Vermont state grant. Online access is available at www.vsac.org

Other states, including Maine, Rhode Island, Connecticut, and Massachusetts, offer undergraduate grants or scholarships usable at Vermont Tech. All students eligible for these grants should apply for them. Contact the Financial Aid office or your high school guidance office to find out which states require supplemental information.

Veterans' Education Benefits

Veterans planning to attend Vermont Tech using the *GI Bill*® should indicate this on their admissions application. Also, please visit the GI Bill® website http://www.benefits.va.gov/gibill and complete the VA form 22-1990 Application for Educational Benefits online or download it and mail it to:

VA Regional Office
PO Box 4626
Buffalo, NY 14240-4616

After the VA processes your application, they send a certificate of eligibility letter to you, a copy of which should be forwarded to:

Vermont Technical College
Attn.: Veterans' Certifying Official
PO Box 500
Randolph Center, VT 05061

Once eligibility is established, student enrollment is automatically certified with the VA every semester that a student is enrolled. If a student does not want to be certified or is no longer eligible for VA benefits, they must notify the Registrar prior to the start of classes.

Veterans need to be prepared to purchase books and have living expenses for the first four to six weeks of classes. The initial payments can be slow, but are retroactive to the start of the term once they begin.

Veterans must notify the Registrar of any changes in tuition and fees after the initial enrollment certification is completed each semester. Post-9/11 (Chapter 33) students who are also receiving Air National Guard tuition reduction (25%) must notify the Student Accounts Office of this prior to the start of each semester.

The VA determines the BAH rate based on the zip code of the physical location of the school with administrative capability. They do not pay based on the campus the student may actually be attending. For Post-9/11 (Chapter 33) Veterans, the BAH rate for all Vermont Tech students and campuses (with the exception of students attending the Williston campus) is based on the Randolph Center zip code no matter where the student lives or attends classes. Students attending the Williston campus are paid the Williston BAH.

The first payments from the VA normally arrive four to six weeks from the beginning of the term, so veterans are not required to pay tuition, fees, or room and board prior to receiving their VA benefits. Students may also set up payment plans to stretch out payments over the term if that becomes necessary. The amount of the payments is dependent on eligibility and entitlements. Vermont Tech does not require Advanced Payment requests for current veteran students or applicants.

The *Vermont National Guard State Educational Assistance Program* provides tuition assistance to eligible members of the Vermont National Guard who are enrolled in undergraduate degree and diploma programs at public colleges in Vermont.

Other

Scholarships administered by the college, including the Vermont Tech Scholars program, are available to students who meet the criteria set for each. Contact the Office of Financial Aid for information about scholarships appropriate to your situation or go to the financial aid page on the college website at www.vtc.edu

Vermont Tech also has institutional grants which are awarded based on financial need or merit. Financial need is determined by using the same criteria used for awarding campus-based aid. The maximum amount awarded depends upon the availability of funds, as well as student needs.

Satisfactory Academic Progress (SAP)

Federal statutes and regulations require that recipients of federal financial aid must progress at a pace to ensure students complete their degrees with the maximum time frame allowed and must be in good standing based on cumulative GPA requirements.

Students are reviewed on a semester basis. Students not making SAP (either the pace or the GPA requirement) as described below lose their financial aid eligibility for all aid types. Students have to successfully appeal to the Director of Financial Aid in order to continue to receive Title IV aid despite failing SAP standards. Students who are academically dismissed from their programs are automatically recognized as failing to meet SAP standards.

All semesters of enrollment, including summer, must be considered in the determination of SAP, even periods in which the student did not receive federal student aid funds.

1. **Pace/Time Progression** Students must successfully complete 67% of their attempted courses within the VSC as recorded and documented by the Office of the Registrar. Dropped courses are not included. Courses from which the student withdraws after the end of the add/drop period are counted toward attempted courses. For financial aid eligibility, total hours attempted, including transfer credits counted toward the degree, cannot exceed 150% of graduation requirements. As an example, if you attempt/enroll in 12 credits for one semester, you must successfully complete 8 of those 12 credits (12 x 67% = 8).
2. **GPA Requirement** Students with fewer than 30 attempted credits must maintain a cumulative GPA of 1.75. Students with 30 attempted credits or greater must maintain a cumulative GPA of 2.0 as recorded and documented by the Office of the Registrar.
3. **Maximum Time Frame** The maximum time frame for students to complete their academic program may not exceed 150% of the published length of the program, measured in credit hours. As an example, if your associate degree program requires 68 credits, the maximum time frame allowed to complete the program would be 102 credits* (68 x 150% = 102).

**Different programs have different degree requirements. Students who have reached the maximum time frame are not eligible for federal financial aid.*

Appeal Process

An appeal is the process by which a student who is not meeting Vermont Tech's SAP standards can petition the school for reconsideration of Title IV eligibility.

A Vermont Tech Satisfactory Academic Progress Appeal form is sent to each student not making SAP. The form explains how the student has failed to meet SAP and the steps that the student needs to take to appeal the loss of financial aid. To appeal, students complete the form and submit it, along with all supporting documentation, to the Director of Financial Aid. As part of the appeal, the student must include information regarding why they failed to make SAP and what has changed in their situation that would allow the student to demonstrate SAP at the next evaluation. An appeal must be based on significant mitigating circumstances that seriously impacted academic performance. Examples of mitigating circumstances are: serious illness, severe injury, death of a family member, and other similar situations.

Approval is based on the likelihood that the student will meet SAP at the next review. Please note that merely filing an appeal does *not* guarantee continued eligibility for federal aid. Students should make every effort to improve their SAP standing, as they are limited to two SAP appeals.

If a student's appeal is approved, the student is considered for federal aid during the probationary periods for which the student has applied and is otherwise eligible. Once the probationary period has concluded, the student may re-establish eligibility to be considered for federal aid for a subsequent semester by meeting SAP standards.

Financial Aid Probation: a status assigned to a student who fails to meet SAP who has appealed and has had eligibility for aid reinstated

Financial Aid Warning: a status assigned to a student who fails to make SAP. The student may continue to receive Title IV aid for one payment period. No appeal is necessary for this status. Students receive a warning that they need to bring their academic standing up to satisfy academic progress standards in their following semester as outlined or they lose their eligibility for aid.

Appeal Denial: if an appeal for federal financial aid is denied, the decision is final for that semester. The student may re-establish eligibility to be considered for federal aid for a subsequent semester by taking action that brings compliance with the GPA and pace/time progression components of SAP policy standards.

Special Circumstances
Students with documented disabilities may be allotted additional time for completion of courses.

Change in Degree Program

All credits earned at Vermont Tech plus transfer credits is normally counted when the student changes degree programs. Each case is evaluated on its own merit. Students may not extend their period of enrollment by changing their majors after accumulating maximum credits for a program.

Grades & Credits

Courses with grades of *W* (withdrawn), *I* (incomplete), or *F* (failed) are counted as courses attempted but not earned and are also counted toward the maximum time frame.

Credits earned for repeated courses and remedial coursework do not count toward academic progress. Courses graded solely on a pass/fail basis that are accepted toward the academic program are included when measuring academic progress.

Transfer Students

Transfer credits accepted toward the student's academic program or degree count as both attempted and earned credits and are counted when measuring SAP, but do not impact GPA.

Review of Awards

The Director of Financial Aid reserves the privilege of reviewing and revising awards. Therefore, the applicant should notify the Office of Financial Aid immediately if there is a change in either the student's or the family's financial situation. This includes the receipt of non-college scholarships. Financial aid awards may be adjusted upon receipt of such items as family contributions, grants, outside scholarships, and loans. In order to be eligible for financial aid, such resources may not exceed the total costs of attending VTC.

If a student receives an outside scholarship that the college does not know about at the time an award letter is prepared, they are issued a revised award reflecting an adjustment to avoid an over-award situation. Any initial adjustment is reflected in unmet need, then the self-help (loan and work) before the gift aid portion of the financial aid package is adjusted.

Most financial aid awards are based originally upon the assumption that a student will enroll as a full-time student (12 or more credits per term) unless they have notified us to the contrary. If a student changes status from full- to part-time enrollment, an aid adjustment may result. A review of enrollment status is completed each term at the end of the add/drop period; any aid adjustments are made accordingly.

Notice of Federal Student Financial Aid Penalties for Drug Law Violations

Per Federal Financial Aid Regulations 34 CFR 668.40, HEAO Sec. 488(g), amended HEA Sec. 485 (20 U.S.C. 1092), HEA Sec. 485(k):

In compliance with the above regulation, this statement serves as notice that a student who has a drug conviction for any offense during a period of enrollment for which the student was receiving Title IV HEA program funds (Federal Pell, Supplemental Education Opportunity Grant, Federal Work-Study, Federal Perkins Loan, Federal Stafford Loans, Federal PLUS Loans, Federal Grad PLUS Loans) under any federal or state law involving the possession or sale of illegal drugs will result in the loss of eligibility for any Title IV program funds (see above listing of program funds).

General Education Requirements

In aligning general education goals at Vermont Tech with the college's overall mission, as addressed within both the prescribed and elective areas of the curriculum, these goals are designed to foster within each student an appreciation for the major domains of human achievement; to provide a common educational experience; to refine ethical reasoning, critical thinking, quantitative, reasoning, qualitative reasoning, writing, information literacy, and communication skills; to nurture civic, cultural, and global awareness and responsibility; to celebrate diversity and common values; to foster lifelong learning; and to produce a well-rounded graduate. This philosophy also aligns with Vermont Tech's Definition of the Educated Person:

> *Vermont Tech faculty, staff, and students believe that an educated person is one who assumes responsibility for their own learning, for career preparation, and for citizenship. We believe that an educated person consistently strives to reach their full potential, can think critically, is globally aware, is civically engaged, is curious, and is an effective communicator.*

The general education requirements (some of which apply more to a bachelor's degree than to an associate degree) result in a graduate who is able to:

- Perform tasks expected of professionals in the field
- Learn new concepts, skills, and technologies
- Communicate effectively, both orally and in writing
- Determine an information need and understand how to find and use that information ethically to solve a problem
- Work in groups and interact appropriately with others, in and out of the group
- Understand the scientific process and apply it to real problems
- Understand qualitative reasoning and apply it to real problems
- Understand quantitative reasoning and apply it to real problems
- Understand algorithmic reasoning and apply it to real problems
- Understand the role of aesthetics in solving problems and recognize alternatives
- Consider appropriate alternatives and weigh competing priorities when engaged in decision-making
- Understand the breadth of cultural enrichment activities available in today's society
- Understand the breadth of personal enrichment activities available in today's society
- Develop and maintain a suite of skills necessary to maintain one's emotional, physical, and financial well-being
- Use sustainable practices in decisions and actions
- Understand the effects of change on organizations
- Understand the cultural impact of decisions and actions
- Consider the effects of changing technology on actions and plans
- Use ethical reasoning in decision-making

The college does not guarantee that general education or elective courses are available and reserves the right to withdraw or restrict any offering if registration exceeds class capacity, an insufficient number of students enroll in the course, or the availability of faculty or other resources are limited. This does not waive the imperative for students to complete each requirement prior to receiving a degree. Some courses offered by major departments may fulfill the elective requirements, but only for students who are not majoring in the department where these courses are offered and only if the General Education Task Force and the Dean of Academic Affairs have approved the courses for elective credit.

Course requirements may also be fulfilled by simultaneous enrollment at other VSC schools under the VSC consortium agreement. Students may not use one course to meet more than one requirement within their program except in meeting a graduation standard or a dual major/degree requirement.

The student should work with their advisor to develop a plan to meet the general education elective requirements without requiring additional class loads or semesters at the college.

Associate degree requirements (20 credits minimum): Depending on specific program requirements, each associate degree student completes a minimum of the following general education requirements:

- 3 credits of English (composition, writing, and research)
- 3 credits of technical communication
- 4 credits of natural or physical sciences
- 1 credit of information technology
- 6 credits of arts/humanities or social sciences
- 3 credits of mathematics/critical thinking

Bachelor's degree requirements (40 credits minimum): Depending on specific program requirements, each bachelor's degree student completes a minimum of the following general education requirements *plus* any other general education courses required to meet the 40 credit minimum:

- 3 credits of English (composition, writing, and research)
- 3 credits of technical communication
- 12 credits of arts/humanities or social sciences (3 credits minimum at the 3000 level)
- 4 credits of information technology
- 7 credits of natural or physical sciences
- 6 credits of mathematics/critical thinking
- 4 credits of other general education electives

Information Technology Requirements
Each student is introduced to computer information technology to include internet orientation, research, email, word processing, and software applications applicable to their field of study.

Mathematics/Critical Thinking Requirements
Each student completes the mathematical or empirical technique for problem-solving in logic and critical thinking appropriate for their program of study. In addition to the regular mathematics offerings, there are other courses under separate subject listings that satisfy the logic and critical thinking component of this requirement.

Natural Sciences Requirements
Each student is introduced to natural or physical sciences, including a lab experience. The course of study is determined by the major and can be filled by coursework available as electives. These science courses include BIO, CHE, and PHY, as well as appropriate coursework under other prefixes.

English Requirements
Each student completes ENG 1061 or equivalent or a sequence of courses that emphasize reading and writing and require the successful completion of a research paper. Degree students may satisfy the requirements by completing one of the following as determined by placement: ENG 1042 and 1060; ENG 1060; ENG 1061. Students who do not place into ENG 1060 or 1061 may take ENG 1042 and 1060 to complete requirements which may require summer courses or additional terms.

Each student completes ENG 2080 or equivalent that emphasizes the principles and forms of communication in the workplace, including a technical report. Each student completes coursework that emphasizes effective speaking, organization, and presentation skills.

Arts & Humanities & Social Sciences Electives (AH/SS)
Each student is exposed to methods of inquiry and major concepts in the arts and humanities and to an understanding of human behavior, personality, politics, economics and the social context of human interaction. Courses at the lower level are offered as survey and special topics courses to expose students to a broad array of concepts and enhance reading, writing, and communication skills. Courses at the upper level are more in-depth and require a higher level of learning and understanding. SS electives include survey courses from ECO, GEO, HIS, PSY, and SSC. For current offerings, see the Academic Scheduling page on the college's website.

Graduation Standards

In addition to required coursework, all Vermont Tech graduates must satisfy four additional graduation standards in written communication, oral communication, information literacy, and quantitative reasoning. These standards are met and evaluated separately for each standard and must be passed at either an associate level competency or a bachelor's level competency prior to degree conferral.

Minors, Concentrations, & Specializations

The Business Technology & Management department offers a minor or concentration in Entrepreneurship and a specialization in Small Business Planning.

A minor is a secondary area of interest that often complements a major or it may be a completely different area of study which serves to balance the student's educational experience and life preparation. A student who satisfies the minor requirements for their area of major study may earn a concentration. Although not a degree requirement of the college, minors and concentrations allow students to group related courses into an organized field of study. Minors require a minimum of 18 credits of related study and a minimum GPA of 2.0 for those credits.

There are no limits to the number of minors that a student may earn. Students apply for a minor in their junior year or by permission of the host department. Students may take courses related to the minor prior to their junior year provided they meet the course requirements. Applying for a minor requires completion of a Declaration of Intention to Complete a VTC Minor form. Applicants must be in good academic standing. Graduates of Vermont Tech with a bachelor's degree may not earn a minor.

Minor in Entrepreneurship

In this minor for non-Business bachelor's degree majors, students must take the following courses. No more than 9 credits of the minor may be applied to the major degree requirements.

BUS 2041	Foundations of Entrepreneurship	3
BUS 2210	Small Business Management	3
BUS 2721	Business Planning Seminar	3
BUS 3041	Applied Entrepreneurship	3
BUS 3230	Principles of Financial Management	3
Select one:		
ACC 1020	Survey of Accounting	3
ACC 2121	Financial Accounting	4
		18-19

Concentration in Entrepreneurship

In this concentration for Business bachelor's degree majors, students must take the courses in the previous table. No more than 9 credits of the minor may be applied to the major degree requirements.

Specialization in Small Business Planning

In this specialization open to all students (including non-degree), students must take the following courses. All credits may be applied toward graduation requirements.

BUS 2210	Small Business Management	3
BUS 2721	Business Planning Seminar	3
BUS 3230	Principles of Financial Management	3
Select one:		
ACC 1020	Survey of Accounting	3
ACC 2121	Financial Accounting	4
		12-13

Advanced Computer Software Development (AC)

This certificate is designed for the student who has already earned a bachelor's degree from an accredited institution and would like to obtain the skills required of a mid- to senior-level software developer. In addition to their prior academic work, a student pursuing this advanced certificate should have completed a minor, certificate, or equivalent coursework in computer science, software engineering, or a related field.

A student with a certificate in Advanced Computer Software Development will be able to:

- Understand the requirements for developing and deploying high-quality, large-scale software systems
- Understand the concepts and practice of relational databases
- Demonstrate technical depth in an area approved by the department chair

To earn a certificate, a student must maintain a cumulative GPA for the entire certificate of at least 3.0. Courses in which the final grade is below a *C* do not count toward the certificate, but, with permission of the host department, a subsequent course may be substituted. For a student with a particularly strong background, up to two courses may be waived by department permission.

First Year

	Fall Semester			Spring Semester	
CIS 3030	Programming Languages	3	CIS 3XXX	Upper level computer elective	3-4
CIS 3050	Algorithms & Data Structures	3	CIS 3010	Database Systems	4
CIS 4150	Software Engineering	3	CIS 4120	Systems Analysis & Design	3
		9			10-11

Agribusiness Management Technology (AAS)

A student with an Associate of Applied Science in Agribusiness Management Technology will be able to:

- Understand the income and expense sources of varied agricultural businesses
- Adequately prepare and assess an agribusiness business plan
- Prepare income and expense accounts
- Understand marketing principles
- Understand small business management including payroll and human resources
- Competently represent agriculture in all venues

First Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	ACC 1010	Computerized Accounting	3
AGR 1011	Agricultural Techniques I	1	ENG 2080	Technical Communication	3
AGR 1050	Livestock Production	3	INT 1005	Self, Career, & Culture	3
CIS 1080	Intro Spreadsheets/Database Mgmnt	2	LAH 1050	Introduction to Soils	4
ENG 10XX	English	3	**Select one**		
Select one			AGR 1030	Animal Reproduction & Genetics	3
MAT 1210	Principles of Mathematics	3	AGR 2030	Animal Nutrition	4
MAT 1221	Finite Mathematics	3	AGR 2040	Forage Production	3
MAT 1311	Precalculus I	3	BIO 1220	Botany	4
Optional			BUS XXXX	BUS elective	3
LAH 1020	Introduction to Horticulture	3	**As required**		
			ENG 10XX	English	3
			MAT 1210	Principles of Mathematics	3
			MAT 1221	Finite Mathematics	3
		15-18			16-17

Second Year

	Fall Semester			Spring Semester	
BUS 2210	Small Business Management	3	BUS 2230	Principles of Marketing	3
BUS 3230	Principles of Financial Mgmnt	3	BUS 3721	Business Planning Seminar	3
CHE 1020	Introduction to Chemistry	4	ELE XXXX	AH/SS elective	3
Select two			**Select two**		
AGR 2040	Forage Production	3	AGR 1030	Animal Repro & Genetics	3
BIO 2040	Entomology	3	AGR 2030	Animal Nutrition	4
BUS XXXX	BUS elective	3	AGR 2040	Forage Production	3
LAH 1020	Introduction to Horticulture	3	BIO 1220	Botany	4
LAH 2020	Plant Propagation	3	BUS XXXX	BUS elective	3
			LAH 1040	Greenhouse Management	3
		16			15-18

Applied Business Management (+2 BS)

Applied Business Management is a degree-completion program that is offered entirely online. Students must have at least 50 transferrable credits from an accredited institution. These credits should include 20 credits consistent with the general education requirements for an associate degree. Any deficiencies will require additional coursework.

A student with a Bachelor of Science in Applied Business Management will be able to meet all of the outcomes of the Business Technology & Management bachelor's degree.

The student, in conjunction with the department chair, develops a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
ACC 2121	Financial Accounting	4	BUS 2230	Principles of Marketing	3
BUS 2020	Principles of Management	3	BUS 3250	Organizational Behavior & Mgmnt	3
BUS 2440	Intro to Business Law	3	ENG 2080	Technical Communication	3
CIS 1041	Computer Applications	3	MAT 2021	Statistics	3
MAT 1221	Finite Mathematics	3	SCI XXXX	Science elective	3-4
		16			15-16

Fourth Year

	Fall Semester			Spring Semester	
BUS 3150	Production & Operations Mgmnt	3	BUS 3811	Business Problem Practicum	3
BUS 3230	Principles of Financial Mgmnt	3	BUS 4080	Business Policy & Strategy Dvlpmnt	3
ECO 2060	Survey of Economics	4	BUS 4530	Technical Project Management	3
ELE 3XXX	Upper level AH/SS elective	3	ELE 3XXX	Upper level AH/SS elective	3
Select one			ELE XXXX	AH/SS elective	3
BUS 3410	Business Ethics	3			
BUS 4310	Business Information Architecture	3			
		16			15

All courses or equivalent coursework must be completed. All coursework from an accredited institution not used to meet the core requirement may be used toward the 120 credit minimum provided that it does not duplicate other coursework being used.

Architectural & Building Engineering Technology (AAS)

Educational objectives for graduates with an Associate of Applied Science in Architectural & Building Engineering Technology that are demonstrated during their workforce careers include:

- **Graphic communication skills**: using freehand sketches, board drafting, presentation graphics, and CAD as tools for design and communication
- **Communication skills**: communicating technical information in writing, speaking, listening, and interpersonal skills to work effectively as part of a team and to interact effectively with clients, the public, and others
- **Technical skills**: understanding residential and commercial building systems, materials, and regulations; applying that knowledge to site layout and material estimating; and using appropriate computer applications
- **Architectural design**: demonstrating knowledge of historical precedents and aesthetics and using design principles (including energy use, conservation, and sustainability concepts) as part of a process to create workable building designs
- **Engineering design**: understanding design principles and applying procedures in the design of building engineering systems in the areas of building structures, HVAC, plumbing, electrical, and lighting with emphasis on energy use, conservation, and sustainability concepts

A student with an Associate of Applied Science in Architectural & Building Engineering Technology will be able to:

- Apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities
- Apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge
- Conduct standard tests and measurements and conduct, analyze, and interpret experiments
- Function effectively as a member of a technical team
- Identify, analyze, and solve narrowly-defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate literature
- Understand the need for and possess an ability to engage in self-directed continuing professional development
- Understand and commit to addressing professional and ethical responsibilities, including a respect for diversity
- Commit to quality, timeliness, and continuous improvement
- Utilize instruments, methods, software, and techniques that are appropriate to produce A/E documents and presentations
- Utilize measuring methods that are appropriate for field, office, or lab
- Apply fundamental computational methods and elementary analytical techniques in sub-disciplines related to architectural engineering

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

First Year

	Fall Semester			Spring Semester	
ARE 1000	ARE Freshman Seminar	1	ARE 1210	Construction Materials & Methods	5
ARE 1011	Intro to Construction Drawing	3	INT 1005	Self, Career, & Culture	3
ARE 1220	Architectural History	3	MAT 1312	Precalculus II	3
ENG 10XX	English	3	PHY 1042	Physics II	4
MAT 1311	Precalculus I	3			
PHY 1041	Physics I	4			
		17			15

Second Year

	Fall Semester			Spring Semester	
ARE 2031	Environmental Systems I	3	ARE 2032	Environmental Systems II	3
ARE 2040	Construction Practices	3	ARE 2052	Architectural Design II	3
ARE 2051	Architectural Design I	3	ARE 2720	Arc & Building Eng Seminar	1
CET 2040	Statics & Strength of Materials	4	CET 2120	Structural Design	3
MAT 1520	Calculus for Engineering	4	ELE XXXX	AH/SS elective	3
			ENG 2080	Technical Communication	3
		17			16

Architectural Engineering Technology (BS)

In addition to all of the objectives included in the associate program, educational objectives for graduates with a Bachelor of Science in Architectural Engineering Technology that are demonstrated during their workforce careers include:

- **Technical design**: designing and integrating complex systems into the building form, emphasizing human comfort and resource conservation, incorporating expertise in a single engineering discipline
- **Communication skills**: using computer-aided design and drafting to communicate complex building systems and exhibit expanded oral presentation skills to effectively explain technical designs; demonstrating improved interpersonal skills for team efforts and for interacting with clients, the public, and others
- **Structural engineering design**: using principles and procedures to analyze and design structures in wood, steel, concrete, and other materials while addressing sustainability issues
- **Mechanical engineering design (HVAC and plumbing systems)**: using principles and procedures to analyze and design building mechanical systems, including the use of energy conservation and sustainability concepts
- **Electrical and lighting engineering design**: using principles and procedures to analyze and design energy-efficient building electrical and lighting systems
- **Engineering management**: understanding and applying the principles of management for engineering business and project administration

In addition to the student outcomes included in the associate program, a student with a Bachelor of Science in Architectural Engineering Technology will be able to:

- Select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly defined engineering technology activities
- Select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies
- Conduct standard tests and measurements; conduct, analyze, and interpret experiments; and apply experimental results to improve processes
- Design systems, components, or processes for broadly defined engineering technology problems appropriate to program educational objectives
- Function effectively as a member or leader of a technical team
- Identify, analyze, and solve broadly defined engineering technology problems
- Know the impact of engineering technology solutions in a societal and global context
- Create, utilize, and present design, construction, and operations documents
- Perform economic analyses and cost estimates related to design, construction, and maintenance of building systems
- Select appropriate materials and practices for building construction
- Apply principles of construction law and ethics in architectural practice
- Perform standard analysis and design in at least one recognized technical specialty within architectural engineering technology that is appropriate to the goals of the program

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

Third Year

	Fall Semester			Spring Semester	
ARE 3020	Structural Analysis	3	ARE 2022	Architectural CAD II	3
ARE 3050	Fluids/Thermodynamics	4	ARE 3030	Steel Structures Design	3
ARE 3111	Codes & Loads: Structural	1	ARE 3040	Electrical/Lighting Systems	3
ARE 3112	Codes & Loads: Mech/Electrical	1	ARE 4030	HVAC Systems	4
ELT 2071	Basic Electricity	3	CHE 1031	General Chemistry I	4
MAT 2532	Calculus II	4			
		16			17

Fourth Year

	Fall Semester			Spring Semester	
ARE 3010	Design Systems Integration	3	ARE 4040	Plumbing Systems	3
ARE 4010	Concrete Structures Design	3	ARE 4720	ARE Senior Project	4
ARE 4020	Architectural Engineering Mgmnt	3	ELE XXXX	AH/SS elective	3
ARE 4050	FE Exam Survey	1	XXX XXXX	Technical elective	3
ELE 3XXX	Upper level AH/SS elective	3			
		13			13

Automotive Technology (AAS)

A student with an Associate of Applied Science in Automotive Technology will be able to:

- Understand the theory of operation, plus diagnostic and service procedures of engines; brakes; suspension and steering systems; electrical and electronic systems; drive-train systems; engine performance; advanced technology vehicles; automatic transmissions; and automotive heating and air-conditioning systems
- Communicate effectively with customers and business relations
- Exhibit the principles of professional conduct in all aspects of customer relations

Students are required to wear black work pants and steel-toed leather work or hiking boots in all lab sections. The college provides t-shirts.

The student must have in their possession a set of tools for use in the lab and during the summer cooperative work experience and must also have a dependable vehicle to travel to and from the lab facilities.

First Year

	Fall Semester			Spring Semester	
ATT 1011	Suspension & Steering I	1.5	ATT 1051	Alignment & Brakes I	2
ATT 1012	Suspension & Steering II	1.5	ATT 1052	Alignment & Brakes II	2
ATT 1020	Engine Diagnostics & Repair	4	ATT 1110	Automotive Electrical Systems Lab	1
ATT 1090	Automotive Electronics Lab	1	CIS 1050	Intro to Spreadsheets	1
ENG 10XX	English	3	ELE XXXX	AH/SS elective	3
GTS 1120	Vehicle Electronics	3	GTS 1040	Vehicle Electrical Systems	3
MAT 1210	Principles of Mathematics	3	PHY 1030	General Physics	4
		17			16
				Summer Semester	
			ATT 2801	ATT Summer Internship	0

Second Year

	Fall Semester			Spring Semester	
ATT 2010	Engine Performance	4	ATT 2030	Adv Engine Performance & Fuel	4
ATT 2020	Body Electronics Systems	4	ATT 2040	Automotive Drive Trains	4
ATT 2802	ATT Summer Internship Review	1	ATT 2060	Advanced Technology Vehicle	4
BUS 2210	Small Business Management	3	ENG 2080	Technical Communication	3
ELE XXXX	AH/SS elective	3	MEC 1020	Manufacturing Processes I	2
		15			17

Business Technology & Management (AAS)

A student with an Associate of Applied Science in Business Technology & Management will be able to:

- Complete the steps of the accounting cycle, including processing and recording typical cash receipts, cash payments, sales, vendor, and payroll transactions
- Prepare and interpret financial statements for service and merchandising businesses on an accrual basis
- Understand module integrated accounting software and use Quickbooks software to record and process typical transactions and prepare financial statements
- Use document and communication collaboration systems to create business documents and to design and develop newsletters, brochures, and other promotional materials
- Write business letters, memos, email messages, instant messages, and blog posts
- Create reports using accurate research methods and citations
- Develop and deliver an effective oral presentation
- Understand the psychology of face-to-face communication and the role of non-verbal communication
- Demonstrate successful team skills, effective listening, and professional behavior
- Effectively utilize resume-writing, interviewing, and job-seeking skills to advance career goals
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance

First Year

	Fall Semester			Spring Semester	
ACC 2121	Financial Accounting	4	ACC 1010	Computerized Accounting	3
BUS 1010	Introduction to Business	3	CIS 1042	Computer Applications II	3
CIS 1041	Computer Applications	3	ENG 2080	Technical Communication	3
ENG 10XX	English	3	INT 1005	Self, Career, & Culture	3
MAT 1210	Principles of Mathematics	3	**Select one**		
			ACC 2122	Managerial Accounting	4
			BUS 2210	Small Business Management	3
			BUS 2410	Human Resource Management	3
			BUS 2440	Introduction to Business Law	3
			CIS 1151	Website Development	3
			XXX XXXX	Program elective	3
		16			15-16

Second Year

	Fall Semester			Spring Semester	
BUS 2020	Principles of Management	3	BUS 2230	Principles of Marketing	3
BUS 2270	Organizational Communication	3	BUS 3811	Business Problem Practicum	3
ELE XXXX	AH/SS elective	3	SCI XXXX	Science elective	3-4
Select two			**Select two**		
BUS 2041	Foundations of Entrepreneurship	3	ACC 2122	Managerial Accounting	4
BUS 2131	Writing for Electronic & Social Media	3	BUS 2132	Management Applications	3
BUS 2210	Small Business Management	3	BUS 2210	Small Business Management	3
BUS 2440	Introduction to Business Law	3	BUS 2440	Introduction to Business Law	3
BUS 2820	Business Intern & Career Seminar	3	CIS 1151	Website Development	3
BUS 3230	Principles of Financial Management	3	XXX XXXX	Program elective	3
CIS 1151	Website Development	3			
SCI XXXX	Science elective	3-4			
XXX XXXX	Program elective	3			
		15-16			15-17

Business Technology & Management (BS)

A student with a Bachelor of Science in Business Technology & Management will be able to:

- Understand the accounting cycle including the processing and recording of typical cash receipts, cash payments, sales, vendor, and payroll transactions on an accrual and cash basis
- Interpret financial statements and prepare budgets
- Apply financial information to broad-based business decision making
- Write business letters, memos, email messages, instant messages, and blog posts
- Create reports using accurate research methods and citations
- Develop and deliver an effective oral team presentation on a strategic business topic
- Understand the structure and function of human behavior in organizations and how behavioral influences impact productivity, organizational effectiveness, and efficiency at the individual, small group, and organizational levels
- Develop marketing strategies to satisfy specific target audiences and create a marketing mix using the "4 Ps" of product, price, place, and promotion
- Apply and integrate marketing concepts with other business disciplines to affect a business strategy
- Perform human resources functions in the areas of selecting, training, and evaluating personnel
- Identify best practices in employee training, development, appraisal, and rewards
- Understand the basic operations, tools, and production functions of an organization involved in the efficient and effective production and delivery of goods and services
- Understand the genesis of project, program, and portfolio management
- Use the tools and techniques involved in initiating, planning, executing, monitoring, controlling, and closing projects
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance and integrate these disciplines to develop and affect corporate strategies and plans

The student, in conjunction with the department chair, develops a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
BUS 2440	Introduction to Business Law	3	BUS 3250	Organizational Behavior & Mgmnt	3
BUS 3230	Principles of Financial Management	3	ELE XXXX	AH/SS elective	3
ECO 2060	Survey of Economics	4	MAT 2021	Statistics	3
MAT 1221	Finite Mathematics	3	**Select two:**		
SCI XXXX	Science elective	3-4	XXX XXXX	Program elective	3
		16-17			15

Fourth Year

	Fall Semester			Spring Semester	
BUS 3150	Production & Operations Mgmnt	3	BUS 4080	Business Policy & Strategy Dvlpmnt	3
ELE 3XXX	Upper level AH/SS elective	3	BUS 4530	Technical Project Management	3
Select two			ELE 3XXX	Upper level AH/SS elective	3
XXX XXXX	Program elective	3	**Select two**		
Select one			XXX XXXX	Program elective	3
BUS 3410	Business Ethics	3			
BUS 4310	Business Information Architecture	3			
		15			15

Business Technology & Management (+2 BS)

The +2 Business Technology & Management program is a degree-completion program. Students must have at least 50 transferrable credits from an accredited institution. These credits should include 20 credits consistent with the general education requirements for an associate degree. Any deficiencies will require additional coursework.

Student outcomes will correlate with the four-year bachelor's degree.

The student, in conjunction with the department chair, develops a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
ACC 2121	Financial Accounting	4	BUS 2230	Principles of Marketing	3
BUS 2020	Principles of Management	3	BUS 4530	Technical Project Management	3
CIS 1041	Computer Applications	3	ENG 2080	Technical Communication	3
ECO 2060	Survey of Economics	4	MAT 2021	Statistics	3
MAT 1221	Finite Mathematics	3	SCI XXXX	Science elective	3-4
		17			15-16

Fourth Year

	Fall Semester			Spring Semester	
BUS 2440	Intro to Business Law	3	BUS 3250	Organizational Behavior & Mgmnt	3
BUS 3150	Production & Operations Mgmnt	3	BUS 3811	Business Problem Practicum	3
BUS 3230	Principles of Financial Mgmnt	3	BUS 4080	Business Policy & Strategy Dvlpmnt	3
XXX XXXX	Elective	3	ELE 3XXX	Upper level AH/SS elective	3
Select one			ELE XXXX	AH/SS elective	3
BUS 3410	Business Ethics	3			
BUS 4310	Business Information Architecture	3			
		15			15

All courses or equivalent coursework must be completed. All coursework from an accredited institution not used to meet the core requirement may be used toward the 120 credit minimum provided that it does not duplicate other coursework being used.

Civil & Environmental Engineering Technology (AE)

The educational objectives for graduates of the Associate of Engineering in Civil & Environmental Engineering Technology program include:

- Communicating technical information in writing, speaking, listening, and interpersonal skills to work effectively as part of a team in the workforce
- Understanding the principles of storm water, hydraulics, environmental engineering, surveying, soils, engineering structures, wastewater, water/wastewater treatment, engineering materials; estimating quantities; and, using appropriate computer applications, applying that knowledge as a consultant in the workforce
- Performing in the workforce with confidence in the use of CAD software, creating site plans from raw survey data, designing sewage disposal systems, and developing profiles and cross-sections for highway design
- Understanding design principles and functioning actively as part of a design team in the workforce with acquired skills and the knowledge of building materials and structures, site development, and estimating quantities
- Demonstrating the skills and ability needed to continue learning through formal education or adapt to changing technologies in the workplace

Students with an Associate of Engineering in Civil & Environmental Engineering Technology will be able to:

- Apply the knowledge, techniques, skills, and modern tools in Civil & Environmental Engineering Technology to narrowly-defined engineering technology activities
- Apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited applications of principles but extensive practical knowledge
- Conduct standard tests and measurements and conduct, analyze, and interpret experiments
- Function effectively as a member of a technical team
- Identify, analyze, and solve narrowly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate literature
- Understand the need for and have the ability to engage in self-directed continuing professional development
- Understand and commit to addressing professional and ethical responsibilities, including a respect for diversity
- Possess a commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

First Year

Fall Semester			Spring Semester		
CET 1000	CET Freshman Orientation	1	CET 1020	Engineering Materials	3
CET 1011	Surveying I	3	CET 1032	Eng/Surveying Computer Apps II	2
CET 1031	Eng/Surveying Computer Apps I	2	ENG 2080	Technical Communication	3
CHE 1031	General Chemistry I	4	INT 1005	Self, Career, & Culture	3
ENG 10XX	English	3	MAT 1312	Precalculus II	3
MAT 1311	Precalculus I	3	**Select one**		
			PHY 1041	Physics I	4
			PHY 2041	Physics I w/ Calculus	4
		16			18

Second Year

Fall Semester			Spring Semester		
CET 2012	Surveying II	4	CET 2030	Environmental Eng & Science	3
CET 2020	Hydraulics & Drainage	3	CET 2050	Civil & Environmental Design	4
CET 2040	Statics & Strength of Materials	4	CET 2110	Mechanics of Soils	3
MAT 1520	Calculus for Engineering	4	CET 2120	Structural Design	3
			ELE XXXX	AH/SS elective	3
		15			16

Computer Engineering Technology (AE)

The educational objectives for graduates of the Associate of Engineering in Computer Engineering Technology program include:

- Having the capability to be immediately employable and productive in the workplace
- Possessing qualifications for positions of responsibility based on knowledge of necessary skills
- Demonstrating knowledgeable in both theory and application
- Engaging in lifelong learning and adapting to new and emerging technologies
- Continuing their formal education

A student with an Associate of Engineering in Computer Engineering Technology will be able to:

- Apply the knowledge, techniques, skills, and modern tools of computer engineering technology to narrowly defined engineering technology activities
- Apply a knowledge of mathematics, science, engineering, and technology to computer engineering technology problems that require limited application of principles but extensive practical knowledge
- Conduct standard tests and measurements and to conduct, analyze, and interpret experiments related to computer engineering technology
- Function effectively as a member of a technical team
- Identify, analyze, and solve narrowly defined computer engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and to identify and use appropriate technical literature
- Understand the need for engaging in self-directed continuing professional development
- Demonstrate an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity
- Demonstrate a commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

First Year

	Fall Semester			Spring Semester	
ELT 1015	Introduction to Engineering	1	ELT 1110	Introduction to Digital Circuits	3
ELT 1031	Electrical Circuits I	4	ELT 2041	Electronic Circuits I	4
MAT 1311	Precalculus I	3	ENG 10XX	English	3
PHY 1041	Physics I	4	INT 1005	Self, Career, & Culture	3
Select one			MAT 1312	Precalculus II	3
CIS 2261	Introduction to Java Programming I	4	**If required**		
CIS 2271	Java Programming	4	CIS 2262	Introduction to Java Programming II	3
		16			16-19

Second Year

	Fall Semester			Spring Semester	
CIS 1151	Website Development	3	CIS 2010	Computer Organization	4
ELT 2015	Introduction to Projects	1	CIS 2151	Networks I	4
ELT 2050	Microcomputer Techniques	4	ELE XXXX	AH/SS elective	3
MAT 1520	Calculus for Engineering	4	ENG 2080	Technical Communication	3
PHY 1042	Physics II	4	**Select one**		
			CIS 2730	Software Engineering Projects	3
			ELT 2720	Electrical Project	2
		16			16-17

Computer Engineering Technology (BS)

In addition to all of the objectives included in the associate program, the educational objectives for graduates of the Bachelor of Science in Computer Engineering Technology program include:

- Demonstrating knowledgeable in both theory and application and analyze, design, and implement electrical and computer systems and products
- Applying project management techniques to electrical/computer systems and qualify for positions of responsibility
- Demonstrating creativity in the design of systems, components, or processes by researching and developing multiple solutions to problems and using a variety of tools and techniques in their work

A student with a Bachelor of Science in Computer Engineering Technology will be able to:

- Select and apply the knowledge, techniques, skills, and modern tools of computer engineering technology to broadly defined engineering technology activities
- Select and apply a knowledge of mathematics, science, engineering, and technology to computer engineering technology problems that require the application of principles and applied procedures or methodologies
- Conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes
- Design systems, components, or processes for broadly defined engineering technology problems appropriate to computer engineering technology educational objectives
- Function effectively as a member or leader on a technical team
- Identify, analyze, and solve broadly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and to identify and use appropriate technical literature
- Demonstrate an understanding of the need for and an ability to engage in self-directed continuing professional development
- Demonstrate an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity
- Demonstrate a knowledge of the impact of engineering technology solutions in a societal and global context
- Demonstrate a commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

Third Year

	Fall Semester			Spring Semester	
CIS 3050	Algorithms & Data Structures	3	ELT 3050	Microprocessor Techniques II	4
CIS 4150	Software Engineering	3	MAT 3720	Topics in Discrete Math	3
ELE 3XXX	Upper level AH/SS elective	3	**Select two**		
ELT 3010	Digital Circuits II	3	XXX 3XXX	Upper level program elective	3-4
MAT 2532	Calculus II	4			
		16			13-15

Fourth Year

	Fall Semester			Spring Semester	
CIS 4020	Operating Systems	4	CIS 4722	CIS Senior Project II	3
CIS 4721	CIS Senior Project I	2	ELE XXXX	AH/SS elective	3
ELT 4010	Computer Architecture	3	ELT 4020	Digital Signal Processing	4
Select two			**Select two**		
XXX 4XXX	Upper level program elective	3-4	XXX 4XXX	Upper level program elective	3-4
		15-17			16-18

Computer Information Technology (AS)

A student with an Associate of Science in Computer Information Technology will be able to:

- Demonstrate fluency in multiple programming languages
- Develop and manage complete websites
- Understand the design and implementation of computer networking
- Understand basic principles for developing and deploying high quality software systems
- Understand how to manage systems, including UNIX-based computers
- Demonstrate a solid background in business processes
- Understand the historical and social context of information technology

First Year

	Fall Semester			Spring Semester	
CIS 1120	Intro to Information Technology	3	CIS 1152	Advanced Website Development	3
CIS 1151	Website Development	3	CIS 2151	Networks I	4
ENG 10XX	English	3	**Select one**		
MAT 1311	Precalculus I	3	ELE XXXX	AH/SS elective	3
Select one			ENG 2080	Technical Communication	3
CIS 2261	Introduction to Java Programming I	4	**Select one**		
CIS 2271	Java Programming	4	MAT 1312	Precalculus II	3
			MAT 2120	Discrete Structures	3
			If required		
			CIS 2262	Introduction to Java Programming II	3
		16			13-16

Second Year

	Fall Semester			Spring Semester	
BUS 2270	Organizational Communication	3	CIS 2235	Advanced System Administration	4
CIS 2230	System Administration	4	CIS 2/3XXX	Upper level computer elective	3-4
CIS 2320	Software QA & Testing	3	SCI XXXX	Science elective	4
Select one			**Select one**		
CIS 2/3XXX	Upper level computer elective	3-4	MAT 1312	Precalculus II	3
MAT 1520	Calculus for Engineering	4	MAT 2021	Statistics	3
Select one			MAT 2120	Discrete Structures	3
ELE XXXX	AH/SS elective	3			
ENG 2080	Technical Communication	3			
		16-17			14-15

Computer Information Technology (BS)

In addition to all of the objectives included in the associate program, a student with a Bachelor of Science in Computer Information Technology will be able to:

- Design and architect systems that utilize computer networking
- Understand the requirements for developing and deploying high-quality, large-scale software systems
- Design, implement, and evaluate a user interface for a computer system
- Understand the concepts and practice of relational databases
- Understand the security issues surrounding information technology and the appropriate tools and techniques to safeguard that security
- Understand the professional, historical, and social context of information technology and make reasoned judgments about the social and ethical implications of their actions

All students must actively participate in the design, development, and evaluation of a sizable information technology system and present the results of that effort.

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
BUS 2440	Introduction to Business Law	3	BUS 4530	Technical Project Management	3
CIS 4040	Computer Security	3	CIS 3010	Database Systems	4
CIS 4150	Software Engineering	3	CIS 4120	Systems Analysis & Design	3
ELE 3XXX	Upper level AH/SS elective	3	ELE XXXX	AH/SS elective	3
Select one			HUM 3060	Cyberethics	3
CIS 3/4XXX	Upper level computer elective	3-4			
ELE XXXX	AH/SS elective	3			
MAT 1520	Calculus for Engineering	4			
		15-16			16

Fourth Year

	Fall Semester			Spring Semester	
CIS 4721	CIS Senior Project I	2	CIS 4722	CIS Senior Project II	3
SCI XXXX	Science elective	4	**Select two**		
Select one			CIS 3/4XXX	Upper level computer elective	3
CIS 3/4XXX	Upper level computer elective	3-4	**Select one**		
Select one			BUS 3041	Applied Entrepreneurship	3
BUS 2041	Foundations of Entrepreneurship	3	CIS 3/4XXX	Upper level computer elective	3
ELE XXXX	AH/SS elective	3			
		12-13			12

Computer Networking (AC)

This certificate is designed for the student who has earned an associate degree or higher from an accredited institution and would like to obtain the skills required to fill a limited role in systems or network administration and support.

A student with a certificate in Computer Networking will be able to:

- Understand the design and implementation of computer networking
- Understand how to manage systems including UNIX-based computers
- Design and architect systems that utilize computer networking
- Demonstrate technical depth in an area approved by the department chair

To earn a certificate, a student must maintain a cumulative GPA for the entire certificate of at least 3.0. Courses where the final grade is below a *C* do not count toward the certificate, but, with permission of the host department, a subsequent course may be substituted. For a student with a particularly strong background, up to two courses may be waived with department permission. A student enrolling in this program is expected to have some academic study of the basic concepts of computer networking or equivalent work experience.

First Year

	Fall Semester			Spring Semester	
CIS 2230	System Administration	4	CIS 2235	Advanced System Administration	4
CIS 3XXX	Upper level computer elective	3-4	CIS 3250	Advanced Network Architectures	4
CIS 3210	Routing Concepts & WAN	4			
		11-12			8

Computer Software Development (AC)

This certificate is designed for the student who has earned an associate degree or higher from an accredited institution and would like to obtain the skills required to fill a limited role in a software development group.

A student with a certificate in Computer Software Development will be able to:

- Demonstrate fluency in an object-oriented programing language
- Develop complete websites
- Understand the behaviors and implementation of computer networking
- Understand basic principles for developing and deploying high-quality software systems

To earn a certificate, a student must maintain a cumulative GPA for the entire certificate of at least 3.0. Courses where the final grade is below a *C* do not count toward the certificate, but, with permission of the host department, a subsequent course may be substituted. For a student with a particularly strong background, up to two courses may be waived with department permission. The student enrolling in this program is expected to have some experience programming in Java or a related language; additional coursework may be necessary for students who do not meet this requirement.

First Year

	Fall Semester			**Spring Semester**	
CIS 1151	Website Development	3	CIS 1152	Advanced Website Development	3
CIS 2260	Object-Oriented Programming	3	CIS 2151	Networks I	4
CIS 2320	Software QA & Testing	3	**Select one**		
			CIS 2010	Computer Organization	4
			CIS 2730	Software Engineering Projects	3
		9			10-11

Computer Software Engineering (AS)

A student with an Associate of Science in Computer Software Engineering will be able to:

- Demonstrate fluency in multiple languages, including one object-oriented language and one scripting language
- Understand the fundamentals of computer hardware, including assembly language
- Develop complete websites
- Understand the behaviors and implementation of computer networking
- Understand basic principles for developing and deploying high-quality software systems
- Understand how to manage systems, including UNIX-based computers
- Work effectively in a group software development effort
- Understand the historical and social context of information technology

All students must actively participate in the design and development of a software system and present the results of that effort.

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

First Year

	Fall Semester			Spring Semester	
CIS 1120	Intro to Information Technology	3	CIS 1152	Advanced Website Development	3
CIS 1151	Website Development	3	CIS 2151	Networks I	4
ENG 10XX	English	3	**Select one**		
MAT 1311	Precalculus I	3	ELE XXXX	AH/SS elective	3
Select one			ENG 2080	Technical Communication	3
CIS 2261	Introduction to Java Programming I	4	**Select one**		
CIS 2271	Java Programming	4	MAT 1312	Precalculus II	3
			MAT 2120	Discrete Structures	3
			If required		
			CIS 2262	Introduction to Java Programming II	3
		16			13-16

Second Year

	Fall Semester			Spring Semester	
CIS 2230	System Administration	4	CIS 2010	Computer Organization	4
CIS 2260	Object-Oriented Programming	3	CIS 2730	Software Engineering Projects	3
CIS 2320	Software QA & Testing	3	SCI XXXX	Science elective	4
Select one			**Select one**		
ELE XXXX	AH/SS elective	3	MAT 2021	Statistics	3
ENG 2080	Technical Communication	3	MAT 2120	Discrete Structures	3
Select one			CIS 2XXX	Computer elective	3-4
BUS 2020	Principles of Management	3	**If required**		
MAT 1520	Calculus for Engineering	4	ENG 2080	Technical Communication	3
		16-17			14-18

Computer Software Engineering (BS)

In addition to all of the objectives included in the associate program, a student with a Bachelor of Science in Computer Software Engineering will be able to:

- Understand the behaviors and implementation of computer networking and develop systems that utilize computer networking
- Understand the requirements for developing and deploying high-quality, large-scale software systems
- Design, implement, and evaluate a user interface for a computer system
- Understand the concepts and practice of relational databases
- Understand the security issues surrounding information technology and the appropriate tools and techniques to safeguard that security
- Understand the workings of modern operating systems, both in theory and in practice, and work with an operating system using administrative tools
- Demonstrate significant technical depth in areas approved by the department chair
- Understand the professional, historical, and social context of information technology and make reasoned judgments about the social and ethical implications of their actions

All students must actively participate in the design, development, and evaluation of a sizable software system and present the results of those efforts.

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum tis shown here.

Third Year

	Fall Semester			Spring Semester	
CIS 3030	Programming Languages	3	BUS 4530	Technical Project Management	3
CIS 3050	Algorithms & Data Structures	3	CIS 3010	Database Systems	4
CIS 4150	Software Engineering	3	CIS 4120	Systems Analysis & Design	3
SCI XXXX	Science elective	4	ELE XXXX	AH/SS elective	3
Select one			**Select one**		
BUS 3/4XXX	Business elective	3	BUS 2230	Principals of Marketing	3
CIS 2XXX	Computer elective	3-4	BUS 2440	Introduction to Business Law	3
MAT 2532	Calculus II	4	CIS 3/4XXX	Upper level computer elective	3-4
		16-17			16-17

Fourth Year

	Fall Semester			Spring Semester	
CIS 3/4XXX	Upper level computer elective	3-4	CIS 3/4XXX	Upper level computer elective	3-4
CIS 4020	Operating Systems	4	CIS 4722	CIS Senior Project II	3
CIS 4721	CIS Senior Project I	2	ELE 3XXX	Upper level AH/SS elective	3
Select two			HUM 3060	Cyberethics	3
BUS 2041	Foundations of Entrepreneurship	3	**Select one**		
CIS 3/4XXX	Upper level computer elective	3-4	BUS 3041	Applied Entrepreneurship	3
ELT 3/4XXX	Upper level ELT elective	3-4	CIS 3/4XXX	Upper level computer elective	3-4
			Select one		
			MAT 2120	Discrete Structures	3
			MAT 3720	Topics in Discrete Math	3
		15-18			18-20

Computer Software Engineering (MS)

A student with a Master of Science in Software Engineering will be able to:

- Demonstrate the ability to implement and analyze sophisticated algorithms and data structures
- Analyze the artifacts created during the software development process
- Demonstrate knowledge of a range of distinct architectural styles, their appropriateness for problems, and possible organizational strategies for adoption
- Choose, read, and evaluate academic and industry publications

Fifth Year

	Fall Semester			Spring Semester	
CIS 5020	Advanced Operating Systems	4	CIS 5120	Adv Systems Analysis & Design	3
CIS 5050	Adv Data Structures & Algorithms	3	CIS 5140	Software Architecture	3
CIS 5150	Advanced Software Engineering	3	CIS 6050	Advanced Compiler Design	3
CIS 6740	Graduate Seminar I	1	CIS 6741	Graduate Seminar II	1
		11			10

Sixth Year

	Fall Semester			Spring Semester	
CIS 5130	Analysis of Software Artifacts	3	CIS 6721	Master's Project	6
Select three			**Select two**		
CIS 5-6XXX	Upper level program elective	3	CIS 5-6XXX	Upper level program elective	3
		12			12

Construction Management (AAS)

A student with an Associate of Applied Science in Construction Management will be able to:

- Communicate construction materials and methods using graphical symbols, drafting practice, and CAD
- Effectively communicate technical instructions and building details using written and spoken English
- Use computers for computation, research, documentation, and communication
- Identify building components and materials
- Demonstrate and model industry-accepted (OSHA) safety practices
- Understand a load table and choose proper materials for structural members
- Create and administer construction schedules
- Operate a total station to establish points, elevations, survey distances, building, and road layout
- Write a business plan
- Complete quantity takeoffs in residential and commercial construction

The student in this program is required to have safety glasses; work boots; speed or combo square; chalk line; tool belt; tape measure; utility knife; and pencils.

First Year

	Fall Semester			Spring Semester	
CPM 1000	CPM Freshman Seminar	1	CPM 1010	Electrical/Mechanical Systems	3
CPM 1021	Construction Graphics I	2	CPM 1022	Construction Graphics II	2
CPM 1031	Residential Construction Systems	3	CPM 1111	Commercial Construction Systems	4
CPM 1032	Construction Lab	2	MAT 1210	Principles of Mathematics	3
ELE XXXX	AH/SS elective	3	PHY 1030	General Physics	4
ENG 10XX	English	3			
Select one					
MAT 1210	Principles of Mathematics	3			
MAT 1311	Precalculus I	3			
		17			16
				Summer Semester	
			CPM 2801	Construction Internship	0

Second Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	BUS 2210	Small Business Management	3
BUS 2440	Introduction to Business Law	3	CPM 2030	Elementary Theory of Structures	4
CPM 2010	Construction Estimates I	3	CPM 2730	Construction Seminar & Project	3
CPM 2020	Construction Project Management	3	ELE XXXX	AH/SS elective	3
CPM 2050	Construction Management Software	1	ENG 2080	Technical Communication	3
CPM 2060	Field Engineering	3			
CPM 2802	Construction Internship Review	1			
		17			16

Construction Management (BS)

A student with a Bachelor of Science in Construction Management will be able to:

- Demonstrate strong technical and problem-solving backgrounds for management level positions
- Control or contribute to a profitable construction-related business
- Adapt to technological and process changes in a rapidly developing field
- Exhibit resiliency, lifelong learning, and a “no excuses” mentality
- Create and implement a company safety plan
- Create, estimate, condense, and graphically communicate Gantt, network diagram, and activity on node project management charts
- Estimate and submit competitive construction bids
- Manage a construction project, including materials and resources, from design phase to close out
- Interpret construction drawings, specifications, and permits for implementation of best management practices
- Properly lay out and site buildings, bridges, and roads from designs
- Manage documentation for payments, inspections, as-built drawings, and progress submittals
- Provide immediate first aid and life-saving care to other employees
- Evaluate multiple choices in the means and methods of construction for fiscal decision-making and planning

Third Year

Construction Track

	Fall Semester			Spring Semester	
CPM 3130	Construction Soils	3	BUS 2410	Human Resource Management	3
CPM 4030	Construction Safety & Risk Mgmnt	3	CPM 3010	Construction Estimates II	3
ELE 3XXX	Upper level AH/SS elective	3	CPM 3020	Construction Documents	3
MAT 1311	Precalculus I	3	CPM 3030	Concrete & Steel Lab	2
			Select one		
			CHE 1020	Introduction to Chemistry	4
			PHY 1041	Physics I	4
		12			15

Civil or Architectural Track

	Fall Semester			Spring Semester	
ACC 2121	Financial Accounting	3	BUS 2410	Human Resource Management	3
BUS 2210	Small Business Management	3	CPM 3010	Construction Estimates II	3
BUS 2440	Introduction to Business Law	3	CPM 3020	Construction Documents	3
CPM 2010	Construction Estimates I	3	CPM 3030	Concrete & Steel Lab	2
CPM 2020	Construction Project Management	3	ELE 3XXX	Upper level AH/SS elective	3
CPM 4030	Construction Safety & Risk Mgmnt	3			
		18			14

	Summer Semester (optional)	
CPM 4801	CPM Senior Summer Internship	0

Fourth Year

	Fall Semester			Spring Semester	
AHS 2035	First Aid & CPR	2	BUS 2230	Principles of Marketing	3
BUS 3230	Principles of Financial Management	3	CPM 4120	Project Planning & Finance	3
CPM 4010	Contract Negotiations	3	CPM 4130	Construction Superintendency	3
CPM 4040	Construction Scheduling	3	CPM 4140	Construction Contracts	3
ELE XXXX	AH/SS elective	3	MAT 1312	Precalculus II	3
As required					
CPM 4802	CPM Senior Internship Review	1			
		15			15

Cybersecurity (AC)

This certificate is designed for the student who has earned a bachelor's degree or higher from an accredited institution and would like to obtain the skills required to work as a security engineer, penetration tester, or network defense analyst. In lieu of a bachelor's degree, a student may enroll in this program if they have worked for a minimum of two years in the cybersecurity field.

A student with a certificate in Cybersecurity will be able to:

- Understand the concepts and applications of security algorithms and protocols
- Design information systems to be resistant to internal and external threats and verify the design's effectiveness
- Understand the concept of intrusion detection and forensic analysis
- Understand national and international laws, regulations, policies, and ethics as they relate to cybersecurity
- Understand current and emerging threats and threat vectors at the strategic and operational levels

First Year

	Fall Semester			**Spring Semester**	
CIS 4011	Information Warfare	3	CIS 4080	Network Security	3
CIS 4240	Ethical Hacking & Network Defense	3	CIS 4040	Computer Security	3
CIS 4310	Computer Forensics	3	CIS 4241	Advanced Ethical Hacking	3
		9			9

Dairy Farm Management Technology (AAS)

A student with an Associate of Applied Science in Dairy Farm Management Technology will be able to:

- Understand dairy cow nutrition and the ration formulation process
- Understand dairy cow reproduction and genetics and implement a breeding program
- Competently milk and feed cows
- Understand heifer-raising and successfully and competently raise heifers
- Manage dairy cow transition from dry to lactating
- Understand the dairy industry and represent it knowledgeably
- Raise and store common New England forages
- Manage a dairy operation budget
- Assess a dairy business and recognize potential improvements
- Write a business plan for a dairy operation

First Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	AGR 1012	Agricultural Techniques II	1
AGR 1011	Agricultural Techniques I	1	AGR 1030	Animal Reproduction/Genetics	3
AGR 1050	Livestock Production	3	AGR 2030	Animal Nutrition	4
CIS 1080	Intro Spreadsheets/Database Mgmnt	2	INT 1005	Self, Career, & Culture	3
ENG 10XX	English	3	LAH 1050	Introduction to Soils	4
Select one			**Select one**		
MAT 1210	Principles of Mathematics	3	ENG 10XX	English	3
MAT 1221	Finite Mathematics	3	ENG 2080	Technical Communication	3
MAT 1311	Precalculus I	3	**As required**		
			CHE 1031	General Chemistry I	4
		15			18-22

Second Year

	Fall Semester			Spring Semester	
AGR 2011	Dairy Herd Management I	4	AGR 2040	Forage Production	3
AGR 2012	Dairy Herd Management II	2	BUS 2210	Small Business Management	3
AGR 2050	Large Animal Diseases	3	BUS 2230	Principles of Marketing	3
AGR 2260	Dairy Financial Management	3	ELE XXXX	AH/SS elective	3
SSC 2720	The Social Ecology of Food	3	**Select one**		
			CHE 1020	Intro to Chemistry	4
			CHE 1031	General Chemistry I	4
			CHE 2060	Principles of Organic Chemistry	4
		15			16

Dairy Production & Processing (C)

A student earning the certificate in Dairy Production & Processing will be able to demonstrate the necessary skills for employment in dairy production and processing. This five-course certificate program consists of courses within the existing Agribusiness Management Technology and Dairy Farm Management associate degree programs.

First Year

	Fall Semester	
AGR 1011	Agricultural Techniques I	1
AGR 1012	Agricultural Techniques II	1
AGR 2011	Dairy Herd Management I	4
AGR 2012	Dairy Herd Management II	2
AGR 2050	Large Animal Diseases	3
BUS XXXX	Business elective	3
		14

Dental Hygiene (BS)

The Vermont Tech entry-level Dental Hygiene program consists of a 3-year CODA-approved associate degree followed by a final year accredited by NEASC, resulting in a Bachelor of Science in Dental Hygiene. Upon successful completion of either the associate or bachelor's degree, the student is eligible for application for dental hygiene licensure.

All dental hygiene professional courses must be taken in the prescribed six-semester sequence. The curriculum is time-intensive and the required courses are rigorous. Complete dedication to coursework is required for successful completion of the program.

A student with a Bachelor of Science in Dental Hygiene will be able to:

- Competently perform the role of a dental hygienist in varied situations and settings
- Demonstrate the functional acuity and rationale for performing clinical techniques
- Continually promote the most current concepts of disease control and prevention
- Emphasize and promote ethical and responsible considerations in patient care
- Make an essential and unique contribution as an integral member of a healthcare team
- Demonstrate a basic knowledge of legal responsibilities and ethical considerations of patient care
- Demonstrate a commitment to continuous and lifelong learning

First Year

	Fall Semester			Spring Semester	
BIO 1030	Nutrition	3	BIO 2012	Human Anatomy & Physiology II	4
BIO 2011	Human Anatomy & Physiology I	4	DHY 1012	Clinical Dental Hygiene I	5
DHY 1011	Pre-Clinical Dental Hygiene	5	DHY 1022	Oral Tissues II/Medical Emergencies	3
DHY 1021	Oral Tissues I	3	PSY 1010	Introduction to Psychology	3
ENG 10XX	English	3			
		18			15

Second Year

	Fall Semester			Spring Semester	
BIO 2120	Elements of Microbiology	4	DHY 2010	Dental Materials	3
DHY 1030	Dental Radiology	3	DHY 2020	General Pathology/Pharmacology	3
DHY 2030	Periodontics	3	DHY 2722	Clinical Dental Hygiene III	4
DHY 2721	Clinical Dental Hygiene II	4	ENG 2080	Technical Communication	3
			MAT 1040	Mathematics for Allied Health	2
		14			15

Third Year

	Fall Semester			Spring Semester	
CIS XXXX	Computer elective	3	CHE 1020	Introduction to Chemistry	4
DHY 2210	Community Oral Health I	2	DHY 2211	Community Oral Health II	1
DHY 3821	Clinical Dental Hygiene IV	6	DHY 2220	Oral Pathology	3
HUM 2020	Bioethics	3	DHY 3822	Clinical Dental Hygiene V	6
Select one					
MAT 1221	Finite Mathematics	3			
MAT 2021	Statistics	3			
		17			14

Fourth Year

	Fall Semester			Spring Semester	
DHY 3010	Evidence-Based Decision Making	3	DHY 3020	Advanced Periodontics	3
DHY 3015	Contemporary Issues in DHY	3	DHY 3030	DHY Methodology & Leadership	3
DHY 4010	Advanced Community Oral Health	3	DHY 4213	Practice Management	3
ELE XXXX	AH/SS elective	3	DHY 4237	Intro to DHY Research Methods	3
			ELE 3XXX	Upper level AH/SS elective	3
		12			15

All DHY/BIO course must be completed with a grade of C *or better to continue in the program*

Dental Hygiene (+2 BS)

All courses are completed online, no campus visits are required, and the student has six years to complete the required courses for the bachelor's degree.

A student with a Bachelor of Science in Dental Hygiene will be able to:

- Earn a bachelor's degree while employed as a practitioner or full-time student
- Explore various occupational settings such as public health, education, sales, and research
- Prepare for further study at the graduate level
- Broaden the knowledge base and education experience in dental hygiene and general education courses
- Demonstrate skills in critical thinking and evidence-based research
- Demonstrate a commitment to lifelong learning

This program holds articulation agreements with Bristol Community College, Cape Cod Community College, Cuyahoga Community College, Middlesex Community College, Monroe Community College, Mount Wachusett Community College, New Hampshire Technical Institute, Quinsigamond Community College, Springfield Technical Community College, and Tunxis Community College associate degree dental hygiene programs. These agreements are designed to maximize the number of credits students will be able to transfer to Vermont Tech.

Third Year

	Fall Semester			Spring Semester	
DHY 3010	Evidence-Based Decision Making	3	CHE 1020	Introduction to Chemistry	4
DHY 3015	Contemporary Issues in DHY	3	CIS XXXX	Computer elective	2-4
ELE XXXX	AH/SS elective	3	DHY 3020	Advanced Periodontics	3
PSY 1050	Human Growth & Development	3	DHY 3030	DHY Methodology & Leadership	3
		12			12-14

Fourth Year

	Fall Semester			Spring Semester	
DHY 4010	Advanced Community Oral Health	3	DHY 4213	Practice Management	3
ELE XXXX	AH/SS elective	3	DHY 4237	Intro to DHY Research Methods	3
Select one			ELE 3XXX	Upper level AH/SS elective	3
HUM 2020	Bioethics	3	**Select one**		
PHI 1040	Introduction to Ethics	3	ELE XXXX	AH/SS elective	3
Select one			POS 1020	American Politics & Government	3
MAT XXXX	Mathematics elective	3			
XXX XXXX	Critical thinking elective	3			
		12			12

In addition to the associate requirements, bachelor's students must complete a minimum of two Arts and Humanities (AH) or Social Sciences (SS) courses, including one at the 3000 level.

All DHY and BIO courses must be completed with a grade of C *or better to continue in the program*

Diesel Power Technology (AAS)

The curriculum uses the National Technician's Education Foundation (NATEF) and Associated Equipment Distributors (AED) diesel task mastery specifications to assess successful learning outcomes.

A student with an Associate of Applied Science in Diesel Power Technology will be able to:

- Use principles of critical thinking in the diagnostic process
- Understand, maintain, and repair advanced electronic systems on trucks and agricultural and earth-moving equipment
- Perform successfully as an entry to B-level heavy-duty service technician

The program is delivered in a well-equipped, 10,000 square foot industrial space within walking distance of the Randolph Center campus.

The student must possess a set of hand tools for use in the lab and for the summer internship program. A tool list is available from the department.

First Year

	Fall Semester			Spring Semester	
DSL 1010	Steering, Suspension, & Alignment	4	DSL 1050	Preventive Maintenance	3
DSL 1020	Diesel Power Systems	4	DSL 1070	Diesel Electrical Systems Lab	1
DSL 1030	Diesel Electronics Lab	1	DSL 1110	Heavy Duty Braking Systems	3
ENG 10XX	English	3	ELE XXXX	AH/SS elective	3
GTS 1120	Vehicle Electronics	3	GTS 1040	Vehicle Electrical Systems	3
MAT 1210	Principles of Mathematics	3	PHY 1030	General Physics	4
		18			17
				Summer Semester	
			DSL 2801	DPT Summer Internship	0

Second Year

	Fall Semester			Spring Semester	
BUS 2210	Small Business Management	3	CIS 1050	Introduction to Spreadsheets	1
DSL 2010	Fuel Systems	4	DSL 2020	Chassis Electrical/Electronic Sys	4
DSL 2802	DPT Summer Internship Review	1	DSL 2030	Hydraulics	3
ELE XXXX	AH/SS elective	3	DSL 2040	Power Transmission	3
ENG 2080	Technical Communication	3	MEC 1020	Manufacturing Processes I	2
		14			13

Diesel Technology (C)

This certificate program allows the student to begin a successful career in the heavy-duty diesel service industry without taking additional math, science, English, and general education courses.

Upon completion of the certificate program, the student can achieve an associate degree in diesel technology with one additional year of study.

The student pursuing the certificate should be cautioned that most upscale original equipment manufacturer's dealerships (Milton CAT, NORTRAX, etc.) require a minimum of an associate degree before they will hire graduates.

First Year

	Fall Semester			Spring Semester	
DSL 1010	Steering, Suspension, & Alignment	4	DSL 1050	Preventive Maintenance	3
DSL 1020	Diesel Power Systems	4	DSL 1070	Diesel Electrical Systems Lab	1
DSL 1030	Diesel Electronics Lab	1	DSL 1110	Heavy Duty Braking Systems	3
DSL 2010	Fuel Systems	4	DSL 2030	Hydraulics	3
GTS 1120	Vehicle Electronics	3	GTS 1040	Vehicle Electrical Systems	3
		16			13

Diversified Agriculture (BS)

A student with a Bachelor of Science in Diversified Agriculture will be able to:

- Understand livestock nutrition and the ration formulation process
- Understand reproduction and genetics and implement a breeding program
- Design, plan, and implement a garden
- Balance a nutrient budget
- Competently identify and treat common New England weeds and pests
- Understand the operational details of various forms of New England agriculture
- Competently recognize livestock disease
- Understand the agriculture industry and represent it knowledgeably
- Raise and store common New England forages
- Manage an agriculture operation budget
- Assess an agricultural business and recognize potential investors
- Write a business plan for an agricultural operation

First Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	AGR 1012	Agricultural Techniques II	1
AGR 1011	Agricultural Techniques I	1	AGR 2030	Animal Nutrition	4
AGR 1050	Livestock Production	3	INT 1005	Self, Career, & Culture	3
CIS 1080	Intro Spreadsheets/Database Mgmnt	2	LAH 1050	Introduction to Soils	4
ENG 10XX	English	3	**Select one**		
Select one			ENG 10XX	English	3
MAT 1210	Principles of Mathematics	3	ENG 2080	Technical Communication	3
MAT 1221	Finite Mathematics	3	**As required**		
MAT 1311	Precalculus I	3	MAT 1210	Principles of Mathematics	3
			MAT 1221	Finite Mathematics	3
			MAT 1312	Precalculus II	3
			As required		
			AGR 1030	Reproduction & Genetics	3
		15			15-21

Second Year

	Fall Semester			Spring Semester	
BUS 3230	Principles Financial Management	3	BUS 2210	Small Business Management	3
CHE 1031	General Chemistry I	4	BUS 2230	Principles of Marketing	3
SSC 2720	The Social Ecology of Food	3	ELE XXXX	AH/SS elective	3
Select two			**Select one**		
XXX XXXX	Program elective	1-4	CHE 2060	Principles of Organic Chemistry	4
			MAT 2021	Statistics	3
			Select two		
			XXX XXXX	Program elective	1-4
		12-18			14-21

Spring Semester- DHM Option

AGR 2011	Dairy Herd Management I	4
AGR 2012	Dairy Herd Management II	2
AGR 2050	Large Animal Diseases	3
AGR 2260	Dairy Financial Management	3
ELE XXXX	AH/SS elective	3
		15

Third Year

Fall Semester

LAH 1020	Introduction to Horticulture	3
Select four		
XXX XXXX	Program elective	1-4
		10-19

Spring Semester

AGR 3050	Advanced Nutrient Management	3
AGR 3111	Vegetable Production	3
BIO 1220	Botany	4
XXX XXXX	Program elective	1-4
Select one		
CHE 2060	Principles of Organic Chemistry	4
MAT 2021	Statistics	3
		14-18

Summer Semester

AGR 4801	AGR Senior Summer Internship	0

Fourth Year

Fall Semester

AGR 4040	Agricultural Products	3
AGR 4802	AGR Sr Summer Internship Review	1
ELE 3XXX	Upper level AH/SS elective	3
Select 2-3		
XXX XXXX	Program elective	1-4
		9-19

Spring Semester

BUS 2410	Human Resource Management	3
BUS 3721	Business Planning Seminar	3
ELE XXXX	AH/SS elective	3
Select one		
CHE 2060	Principles of Organic Chemistry	4
MAT 2021	Statistics	3
Select 1-2		
XXX XXXX	Program elective	1-4
		13-21

	Fall Electives			Spring Electives	
AGR 1061	Burls to Boards	3	AGR 1030	Reproduction & Genetics	3
AGR 2011	Dairy Herd Management I	4	AGR 2011	Dairy Herd Management I	4
AGR 2012	Dairy Herd Management II	1	AGR 2012	Dairy Herd Management II	1
AGR 2040	Forage Production	3	AGR 2040	Forage Production	3
AGR 2050	Large Animal Diseases	3	AGR 2050	Large Animal Diseases	3
AGR 2510	Brewing	3	AGR 2060	Beef Production †	3
AGR 2512	Distilling Spirits Production	2	AGR 2514	Mushroom Gathering	2
AGR 2519	Cheesemaking	2	AGR 2517	Wildcrafting	2
AGR 3030	Advanced Dairy Nutrition †	3	AGR 3020	Advanced Livestock Production †	3
AGR 3110	Apples, Berries, & Bees †	3	AGR 3040	Maple Production	3
BIO 1020	Environmental Biology	4	BIO 2030	Plant Pathology	3
BIO 2040	Entomology	3	DSL 1050	Preventative Maintenance	3
DSL 1010	Steering & Suspension	4	DSL 1070	Diesel Electrical Systems Lab	1
DSL 1030	Diesel Electronics Lab	1	DSL 1110	Heavy Duty Brake Systems	3
GTS 1120	Vehicle Electronics	3	EQS 4110	Equine Health & Disease †	3
LAH 1030	Woody Ornamentals †	3	GTS 1040	Vehicle Electrical Systems	3
LAH 2020	Plant Propagation	3	LAH 1040	Greenhouse Management	3
LAH 2030	Herbaceous Plant Materials †	3	MEC 1190	Advanced Welding Processes	3
MEC 1020	Manufacturing Processes	2	VET 1020	Animal Anatomy & Physiology	4
MEC 1180	Introduction to Welding Processes	3			

Courses marked with † are offered every other year.

Electrical Engineering Technology (AE)

The educational objectives for graduates of the Associate of Engineering in Electrical Engineering Technology program include:

- Having the capability to be immediately employable and productive in the workplace
- Possessing qualifications for positions of responsibility based on knowledge of necessary skills
- Demonstrating knowledgeable in both theory and application
- Engaging in lifelong learning and adapting to new and emerging technologies
- Continuing their formal education

A student with an Associate of Engineering in Electrical Engineering Technology will be able to:

- Apply the knowledge, techniques, skills, and modern tools of Electrical Engineering Technology to narrowly defined engineering technology activities
- Apply knowledge of mathematics, science, engineering, and technology to electrical engineering technology problems that require limited application of principles but extensive practical knowledge
- Conduct standard tests and measurements and conduct, analyze, and interpret experiments related to electrical engineering technology
- Function effectively as a member of a technical team
- Identify, analyze, and solve narrowly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate technical literature
- Understand the need for and engage in self-directed continuing professional development
- Understand and commit to addressing professional and ethical responsibilities, including a respect for diversity
- Commit to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

First Year

	Fall Semester			Spring Semester	
ELT 1015	Introduction to Engineering	1	CIS 2025	C Programming	3
ELT 1031	Electrical Circuits I	4	ELT 1110	Introduction to Digital Circuits	3
ENG 10XX	English	3	ELT 2041	Electronic Circuits I	4
Select one			INT 1005	Self, Career, & Culture	3
MAT 1311	Precalculus I	3	MAT 1312	Precalculus II	3
MAT 1520	Calculus for Engineering	4			
Select one					
PHY 1041	Physics I	4			
PHY 2041	Physics I w/ Calculus	4			
		15-16			16

Second Year

	Fall Semester			Spring Semester	
ELT 1032	Electrical Circuits II	4	ELE XXXX	AH/SS elective	3
ELT 2015	Introduction to Projects	1	ELT 2042	Electronic Circuits II	4
ELT 2050	Microcomputer Techniques	4	ELT 2130	Industrial Electronics	4
MAT 1520	Calculus for Engineering	4	ELT 2720	Electrical Project	2
Select one			ENG 2080	Technical Communication	3
PHY 1042	Physics II	4			
PHY 2042	Physics II with Calculus	4			
		17			16

Electrical Engineering Technology (BS)

In addition to all of the objectives included in the associate program, the educational objectives for graduates of the Bachelor of Science in Electrical Engineering Technology program include:

- Analyzing, designing, and implementing electrical and electronic systems and products
- Applying project management techniques to electrical/electronic systems
- Demonstrating creativity in the design of systems, components, or processes by researching and developing multiple solutions to problems and using a variety of tools and techniques in their work

A student with a Bachelor of Science in Electrical Engineering Technology will be able to:

- Select and apply the knowledge, techniques, skills, and modern tools of electrical engineering technology to broadly defined engineering technology activities
- Select and apply a knowledge of mathematics, science, engineering, and technology to electrical engineering technology problems that require limited application of principles and applied procedures or methodologies
- Conduct standard tests and measurements; conduct, analyze, and interpret experiments; and apply experimental results to improve processes
- Design systems, components, or processes for broadly defined engineering technology problems appropriate to Electrical Engineering Technology educational objectives
- Function effectively as a member or leader of a technical team
- Identify, analyze, and solve broadly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate technical literature
- Understand the need for and engage in self-directed continuing professional development
- Understand and commit to addressing professional and ethical responsibilities, including a respect for diversity
- Demonstrate a knowledge of the impact of engineering technology solutions in a societal and global context
- Commit to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

Third Year

Fall Semester			Spring Semester		
ELE 3XXX	Upper level AH/SS elective	3	ELT 2061	Electromechanical Systems I	4
ELM 3015	Sensors & Instrumentation	3	ELT 3050	Microprocessor Techniques II	4
ELT 3010	Digital Circuits II	3	MAT 3170	Applied Mathematics for Engineering	3
ELT 3053	Electronics III	4	PHY 3120	Modern Physics	3
MAT 2532	Calculus II	4			
		17			14

Fourth Year

Fall Semester			Spring Semester		
ELE XXXX	AH/SS elective	3	ELM 4232	Control Systems II	3.5
ELM 4015	Electromechanical Power Systems	3.5	ELT 3040	Electronic & Data Communications	3.5
ELM 4231	Control Systems I	3.5	ELT 4020	Digital Signal Processing	3
ELM 4241	Senior Lab	1	ELT 4702	Electrical Project II	3
ELT 4701	Electrical Project I	2			
XXX XXXX	Technical elective	3			
		15			13

General education requirements for the program include 24 credits minimum, nine of which must contain a strong writing component. Three of these credits are included in ELT 4701 and 4702.

Electromechanical Engineering Technology (BS)

The educational objectives for graduates of the Bachelor of Science in Electromechanical Engineering Technology program include:

- Having the capability to be immediately employable and productive in the workplace
- Demonstrating knowledge in both theory and application and analyzing, designing, and implementing electrical/electromechanical systems and products
- Qualifying for positions of responsibility and to apply project management techniques to electrical/electromechanical systems
- Demonstrating creativity in the design of systems, components, or processes by researching and developing multiple solutions to problems and using a variety of tools and techniques in their work
- Demonstrating preparation for lifelong learning and adapt to new and emerging technologies
- Continuing their formal education

A student with a Bachelor of Science in Electromechanical Engineering Technology will be able to:

- Select and apply the knowledge, techniques, skills, and modern tools of electromechanical engineering technology to broadly defined engineering technology activities
- Select and apply a knowledge of mathematics, science, engineering, and technology to electromechanical engineering technology problems that require the application of principles and applied procedures or methodologies
- Conduct standard tests and measurements; conduct, analyze, and interpret experiments; and apply experimental results to improve processes
- Design systems, components, or processes for broadly defined engineering technology problems appropriate to Electromechanical Engineering Technology educational objectives
- Function effectively as a member or leader on a technical team
- Identify, analyze, and solve broadly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate technical literature
- Understanding the need for and engage in self-directed continuing professional development
- Understand and commit to addressing professional and ethical responsibilities, including a respect for diversity
- Demonstrate knowledge of the impact of engineering technology solutions in a societal and global context
- Commit to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

Third Year
Electrical Track

	Fall Semester			Spring Semester	
ELM 3015	Sensors & Instrumentation	3	ELT 2061	Electromechanical Systems I	4
MAT 2532	Calculus II	4	MAT 3170	Applied Mathematics for Engineering	3
MEC 1011	Design Communication I	2	MEC 1020	Manufacturing Processes I Lab	2
MEC 2010	Fluid Mechanics & Fluid Systems	4	MEC 2065	Kinematics & Dynamics	4
MEC 2035	Statics & Strength of Materials	3	MEC 2071	Machine Design	2
			PHY 3120	Modern Physics	3
		16			18

Third Year
Mechanical Track

	Fall Semester			Spring Semester	
CIS 2025	C Programming	4	ELT 2041	Electronic Circuits I	4
ELM 3015	Sensors & Instrumentation	3	ELT 2050	Microcomputer Techniques	4
ELT 1032	Electrical Circuits II	4	ELT 2061	Electromechanical Systems I	4
MAT 2532	Calculus II	4	MAT 3170	Applied Mathematics for Engineering	3
			PHY 3120	Modern Physics	3
		15			18

Fourth Year

	Fall Semester			Spring Semester	
ELE XXXX	AH/SS elective	3	ELE 3XXX	Upper level AH/SS elective	3
ELM 4015	Electromechanical Power Systems	3.5	ELM 4232	Control Systems II	3.5
ELM 4231	Control Systems I	3.5	ELM 4702	Electrical Project II	3
ELM 4701	Electromechanical Project I	2	ELT 3040	Electronic & Data Communications	3.5
XXX XXXX	Technical elective	3-4			
		15-16			13

**General education requirements for this program include a cumulative 24 credits, nine of which must contain a strong writing component. Some of these credits may have been earned in previous degree studies. Three of these credits are included in* ELM 4701 *and* 4702 *and three credits must be at the 3000 level.*

Entrepreneurship (AAS)

A student with an Associate of Applied Science in Entrepreneurship will be able to:

- Complete the steps of the accounting cycle, including processing and recording typical cash receipts, cash payments, sales, vendor, and payroll transactions
- Prepare and interpret financial statements for service and merchandising businesses on an accrual basis
- Understand module integrated accounting software and use Quickbooks software to record and process typical transactions and prepare financial statements
- Use document and communication collaboration systems to create business documents and to design and develop newsletters, brochures, and other promotional materials
- Write business letters, memos, email messages, instant messages, and blog posts
- Create reports using accurate research methods and citations
- Develop and deliver an effective oral presentation
- Understand the psychology of face-to-face communication and the role of non-verbal communication
- Demonstrate successful team skills, effective listening, and professional behavior
- Effectively utilize resume-writing, interviewing, and job-seeking skills to advance career goals
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance
- Recognize a business opportunity that meets their individual needs
- Understand how to launch an entrepreneurial career

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

First Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	ACC 1010	Computerized Accounting	3
INT 1021	Creativity & Innovation	3	CIS 1042	Computer Applications II	3
CIS 1041	Computer Applications	3	BUS 2210	Small Business Management	3
ENG 10XX	English	3	ENG 2080	Technical Communication	3
MAT 1210	Principles of Mathematics	3	INT 1005	Self, Career, & Culture	3
		15			15

Second Year

	Fall Semester			Spring Semester	
BUS 2020	Principles of Management	3	BUS 2230	Principles of Marketing	3
BUS 2041	Foundations of Entrepreneurship	3	BUS 3041	Applied Entrepreneurship	3
BUS 2270	Organizational Communication	3	BUS 3721	Business Planning Seminar	3
BUS 3230	Principles of Financial Management	3	XXX XXXX	Elective	3
ELE XXXX	AH/SS elective	3	SCI XXXX	Science elective	3-4
		15			15-16

Entrepreneurship (BS)

A student with a Bachelor of Science in Entrepreneurship will be able to:

- Understand the accounting cycle including the processing and recording of typical cash receipts, cash payments, sales, vendor, and payroll transactions on an accrual and cash basis
- Interpret financial statements and prepare budgets
- Apply financial information to broad-based business decision making
- Write business letters, memos, email messages, instant messages, and blog posts
- Create reports using accurate research methods and citations
- Develop and deliver an effective oral team presentation on a strategic business topic
- Understand the structure and function of human behavior in organizations and how behavioral influences impact productivity, organizational effectiveness, and efficiency at the individual, small group, and organizational levels
- Develop marketing strategies to satisfy specific target audiences and create a marketing mix using the “4 Ps” of product, price, place, and promotion
- Apply and integrate marketing concepts with other business disciplines to affect a business strategy
- Perform human resources functions in the areas of selecting, training, and evaluating personnel
- Identify best practices in employee training, development, appraisal, and rewards
- Understand the basic operations, tools, and production functions of an organization involved in the efficient and effective production and delivery of goods and services
- Understand the genesis of project, program, and portfolio management
- Use the tools and techniques involved in initiating, planning, executing, monitoring, controlling, and closing projects
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance and integrate these disciplines to develop and affect corporate strategies and plans
- Recognize a business opportunity that meets their individual needs
- Understand how to launch an entrepreneurial career

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
BUS 2440	Introduction to Business Law	3	BUS 3250	Organizational Behavior & Mgmnt	3
ECO 2060	Survey of Economics	4	ELE XXXX	AH/SS elective	3
MAT 1221	Finite Mathematics	3	MAT 2021	Statistics	3
SCI XXXX	Science elective	3-4	**Select two**		
			XXX XXXX	Elective	3
		13-14			15

Fourth Year

	Fall Semester			Spring Semester	
BUS 3150	Production & Operations Mgmnt	3	BUS 4080	Business Policy & Strategy Dvlpmnt	3
BUS 3410	Business Ethics	3	BUS 4530	Technical Project Management	3
BUS 4310	Business Information Architecture	3	ELE 3XXX	Upper level AH/SS elective	3
ELE 3XXX	Upper level AH/SS elective	3	XXX XXXX	Program elective	3
XXX XXXX	Program elective	3	**Select two**		
			XXX XXXX	Elective	3
		15			15

Entrepreneurship (+2 BS)

A student with a Bachelor of Science in Entrepreneurship will be able to:

- Understand the accounting cycle including the processing and recording of typical cash receipts, cash payments, sales, vendor, and payroll transactions on an accrual and cash basis
- Interpret financial statements and prepare budgets
- Apply financial information to broad-based business decision making
- Write business letters, memos, email messages, instant messages, and blog posts
- Create reports using accurate research methods and citations
- Develop and deliver an effective oral team presentation on a strategic business topic
- Understand the structure and function of human behavior in organizations and how behavioral influences impact productivity, organizational effectiveness, and efficiency at the individual, small group, and organizational levels
- Develop marketing strategies to satisfy specific target audiences and create a marketing mix using the “4 Ps” of product, price, place, and promotion
- Apply and integrate marketing concepts with other business disciplines to affect a business strategy
- Perform human resources functions in the areas of selecting, training, and evaluating personnel
- Identify best practices in employee training, development, appraisal, and rewards
- Understand the basic operations, tools, and production functions of an organization involved in the efficient and effective production and delivery of goods and services
- Understand the genesis of project, program, and portfolio management
- Use the tools and techniques involved in initiating, planning, executing, monitoring, controlling, and closing projects
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance and integrate these disciplines to develop and affect corporate strategies and plans
- Recognize a business opportunity that meets their individual needs
- Understand how to launch an entrepreneurial career

The student, in conjunction with the department chair, may develop a sequence of courses to best meet their background and needs that still satisfies the degree requirements. The +2 student must have at least 50 transferrable credits from an accredited institution. These credits should include 20 credits consistent with the general education requirements for an associate degree. Any deficiencies will require additional coursework.

A typical curriculum is shown here.

Third Year

	Fall Semester			Spring Semester	
ACC 1020	Survey of Accounting	3	ACC 1010	Computerized Accounting	3
BUS 2020	Principles of Management	3	BUS 2440	Intro to Business Law	3
BUS 2041	Foundations of Entrepreneurship	3	BUS 3041	Applied Entrepreneurship	3
CIS 1041	Computer Applications	3	BUS 3250	Organizational Behavior & Mgmnt	3
ECO 2060	Survey of Economics	4	ENG 2080	Technical Communication	3
MAT 1221	Finite Mathematics	3	MAT 2021	Statistics	3
		19			18

Fourth Year

	Fall Semester			Spring Semester	
BUS 2210	Small Business Management	3	BUS 2230	Principles of Marketing	3
BUS 2270	Organizational Communication	3	BUS 3721	Business Planning Seminar	3
BUS 3150	Production & Operations Mgmnt	3	BUS 4080	Business Policy & Strategy Dvlpmnt	3
BUS 3230	Principles of Financial Management	3	BUS 4530	Technical Project Management	3
ELE XXXX	AH/SS elective	3	ELE 3XXX	Upper level AH/SS elective	3
SCI XXXX	Science elective	3-4			
		18-19			15

Equine Studies (AAS)

A student with an Associate in Applied Science in Equine Studies will be able to:

- Demonstrate fundamentals of equine care and facility management by utilizing knowledge to satisfactorily complete a predetermined set of skills with a minimum of 80% success
- Assess, critique, devise, and implement plans for using both teaching and training techniques, including their application in hands-on lab settings
- Understand issues in the equine industry and present an appraisal and recommendations regarding a defined area of the industry
- Review, examine, and draw conclusions about scientific theories concerning equine health, behavior, and care

The student must arrange for their own transportation to and from the equine facility, which is located seven miles from campus. The program encourages students to carpool whenever possible.

First Year

	Fall Semester			Spring Semester	
BIO 2320	Zoology	4	EQS 1012	Introduction to Equine Studies II	2
ENG 10XX	English	3	EQS 1032	Stable Management	3
EQS 1010	Introduction to Equine Studies I	4	EQS 2025	Equitation*	1
EQS 2011	Equine Training I	3	INT 1005	Self, Career, & Culture	3
EQS 2025	Equitation*	1	VET 1020	Animal Anatomy & Physiology	4
			Select one		
			MAT 1210	Principles of Mathematics	3
			MAT 1221	Finite Mathematics	3
		15			16
				Summer Semester (optional)	
			EQS 2801	EQS Summer Internship	0

Second Year

	Fall Semester			Spring Semester	
ELE XXXX	AH/SS elective	3	AGR 2030	Animal Nutrition	4
ENG 2080	Technical Communication	3	CIS 1050	Introduction to Spreadsheets	1
EQS 2025	Equitation*	1	EQS 2020	Equine Lameness	3
EQS 3012	Equine Training II	3	EQS 2025	Equitation*	1
EQS 3031	Riding Instruction I	3	EQS 3032	Riding Instruction II	3
EQS 4110	Equine Health & Diseases	3	EQS 4610	Equine Studies Senior Seminar	3
Optional			**Optional**		
EQS 2041	Equine Massage I	3	EQS 3042	Equine Massage II	3
		16-19			15-18

** Students must complete a minimum of four semesters of EQS 2025 (two in the freshman year) unless the department approves an alternate schedule.*

Fire Science (AAS)

A student with an Associate of Applied Science in Fire Science will be able to:

- Demonstrate the technical skills needed for firefighting, emergency medical services, and critical thinking skills used for fire prevention, control, suppression, and extinguishment
- Provide ethical leadership in their community, fire department, and personal lives
- Deliver professional presentations concerning fire safety in the public sector and produce clear, concise, and accurate written reports required by the profession
- Understand scientific principles of fire and combustion, chemicals in hazardous materials, fire control, and extinguishment
- Recognize the importance of building construction concepts and materials in fire safety; the effects of heat and fire on buildings; and the impact of fire to the personal safety of building occupants
- Understand the science of hydraulics by demonstrating analytical skills needed for water system design including supply and suppression systems, community, and fire ground needs
- Understand concepts of wellness and the CPAT

Successful completion of AHS 2011 and licensure as an Emergency Medical Technician through the National Registry of Emergency Medical Technicians (NREMT) is required for graduation from the Fire Science program. EMT licensure is a prerequisite for licensure as an Advanced EMT and for admission into paramedic training programs. The cost of the exam is covered by the State of Vermont the first time. A student who fails the exam is responsible for the fees for the retake. Retakes are available monthly. The student must pass the exam by the end of the sophomore year in order to graduate that year. Otherwise, the student will not be able to graduate until the following year. For more details, see AHS 2011 under *Course Descriptions*.

First Year

	Fall Semester			**Spring Semester**	
CIS 1050	Introduction to Spreadsheets	1	ELE XXXX	AH/SS elective	3
ENG 10XX	English	3	ENG 2080	Technical Communication	3
FSC 1010	Construction & Fire Protection	3	FSC 1022	Firefighting Services II	4
FSC 1021	Firefighting Services I	6	FSC 1220	Fire Service Leadership	3
FSC 1030	History & Impact of Fire in America	3	MAT 1210	Principles of Mathematics	3
		16			16

Second Year

	Fall Semester			**Spring Semester**	
AHS 2011	Emergency Medical Service	5	ELE XXXX	AH/SS elective	3
CHE 1020	Introduction to Chemistry	4	FSC 2020	Hydraulics & Water Supply	3
FSC 2220	Firefighting Strategy & Tactics	3	FSC 2210	Fire Administration	3
FSC 2250	Fire & Life Safety Educator	3	FSC 2230	HazMat Chemistry & Operations	3
			FSC 2240	Fire Protection Systems	3
			FSC 2260	Career Wellness: CPAT Prep	3
		15			18

Internships may be available for qualified students as either residential or day programs.

Forestry (C)

A student with a certificate in Forestry will be able to:

- Operate sawmills
- Use a chainsaw
- Operating timber harvesting equipment
- Apply technical forestry skills

First Year

	Fall Semester			Spring Semester	
AGR 1061	Burls to Boards	3	AGR 1062	Timber Harvesting	4
BIO 1241	Forest Ecology	4	AGR 1801	Forestry Internship	4
BIO 2710	Special Topics: Dendrology	4	BIO 1220	Botany	4
BUS 2210	Small Business Management	3			
CIS 1080	Intro Spreadsheets/Database Mgmnt	2			
		16			12

General Engineering Technology

Administered by the college's Continuing Education & Workforce Development office, GET degree programs are industry-sponsored and offered primarily at the facilities of sponsoring organizations. The curriculum consists of initial courses common to all GET degree programs, as well as a sequence of technology foundation and technical emphasis courses specific to the workforce education needs being served. These industry-specific technical courses are developed by a curriculum development team comprised of Vermont Tech faculty and representatives from the sponsoring organizations. The goal is to offer the student a flexible, interdisciplinary path to the acquisition of basic engineering concepts and specific job-related skills needed to excel in their current positions and prepare for career growth.

General Education

ELE 2XXX	AH elective	3
ELE 2XXX	SS elective	3
ENG 1061	English Composition	3
ENG 2080	Technical Communication	3
MAT XXXX	Mathematics elective	3-5
SCI XXXX	Science elective	4
		19-21

Foundation Courses

These courses provide a general educational foundation appropriate to the particular technical emphasis. Foundation courses should satisfy the following requirements and cannot be used to satisfy a general education or technical emphasis course requirement:

CIS XXXX	Computer elective	3
CIS XXXX	Computer elective	3
XXX XXXX	Advanced math/science elective	3-5
XXX XXXX	Communications elective	3
XXX XXXX	Communications elective	3
XXX XXXX	Technical elective	3
		18-20

Technical Emphasis Courses

A combination of technical courses based on the degree emphasis are required. These courses must have the following characteristics:

- Most have lab or hands-on components; these experiences build troubleshooting and problem-solving skills as well as provide exposure to the course topics
- At least one multi-course sequence is included; the program should not contain only introductory courses. Typically, there are 1000-level courses followed by 2000-level courses which lead to more advanced issues. Prerequisites are established and reinforced
- There is a capstone experience (typically a senior project course) which requires students to call upon the comprehensive skills/knowledge gained in the program
- All courses integrate theoretical topics with practical skills

Landscape Design & Sustainable Horticulture (AAS)

A student with an Associate of Applied Science in Landscape Design & Sustainable Horticulture will be able to:

- Demonstrate a mastery of freehand sketching, presentation graphics, presentation layout, and CAD as effective tools for the formulation, exploration, communication, and presentation of design ideas
- Communicate technical and theoretical information effectively to clients, customers, and coworkers, both through the written and spoken word;
- Demonstrate excellent listening and interpersonal skills;
- Exhibit professional conduct in all aspects of client/customer and employee/employer relations
- Comprehend, analyze, solve, and apply materials and methods of construction;
- Understand site engineering issues such as grading and drainage;
- Create and maintain healthy plant environments;
- Install, operate, and understand the advantages and disadvantages of greenhouse and nursery environmental systems;
- Understand integrated pest management;
- Use appropriate computer applications
- Demonstrate fundamental design principles and practice, including site analysis;
- Take base plan measurements and prepare and study historic precedent in order to analyze, create, and apply these concepts to comprehensive and holistic landscape designs
- Comprehend, analyze, solve, and apply identification, production, and use of herbaceous and woody ornamental plants
- Propagate
- Diagnose insect and disease problems and assimilate integrated, environmentally safe, and sustainable approaches for their management
- Understand soil properties
- Demonstrate landscape applications such as plant selection, planting and pruning practices
- Understand cultural requirements and practices and maintenance
- Demonstrate practical aspects of organizing and managing a small business
- Understand marketing (product, place, pricing, and promotion) and management skills
- Demonstrate a working knowledge of generally accepted accounting practices as they apply to the horticultural/design industry
- Demonstrate mastery of essential “soft skills”: interpersonal communication, professionalism, and teamwork

First Year

	Fall Semester			Spring Semester	
CIS 1050	Introduction to Spreadsheets	1	BIO 1220	Botany	4
ENG 10XX	English	3	ELE XXXX	AH/SS elective	3
LAH 1020	Introduction to Horticulture	3	LAH 1031	CAD for Landscape Applications	2
LAH 1021	Landscape Graphics	3	LAH 1050	Introduction to Soils	4
LAH 1030	Woody Ornamentals †	3	LAH 2011	Introduction to Landscape Design	3
MAT 1210	Principles of Mathematics	3			
		16			16

	Summer Semester	
LAH 2801	LDSH Summer Internship	0

Second Year

	Fall Semester			Spring Semester	
BIO 2040	Entomology/Ecological Pest Mgmnt	3	BIO 2030	Plant Pathology	3
BUS 2210	Small Business Management	3	ELE XXXX	AH/SS elective	3
LAH 2010	Landscape Construction Practices	3	ENG 2080	Technical Communication	3
LAH 2020	Plant Propagation	3	LAH 1040	Greenhouse Management	3
LAH 2030	Herbaceous Plant Materials †	3	LAH 2012	Landscape Design II	3
LAH 2802	LDSH Summer Internship Review	1			
		16			15

Courses marked with † are offered every other year.

Manufacturing Engineering Technology (BS)

A student with a Bachelor of Science in Manufacturing Engineering Technology will be able to:

- Apply knowledge of and experience with materials and manufacturing processes
- Apply knowledge of and experience with product design process, tooling, and assembly
- Understand manufacturing systems, automation, and operations
- Select and apply knowledge of statistics; quality and continuous improvement; and industrial organization and management
- Apply knowledge of mathematics, science, engineering, and technology principles with practical knowledge to solve both broadly defined and narrowly constrained problems related to manufacturing systems
- Conduct standard tests and measurements and conduct, analyze, and interpret experiments
- Apply creativity and innovation in the design and planning of manufacturing processes and production systems
- Function effectively as a member of a technical team
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate technical literature
- Understand the purpose of and engage in self-directed continuing professional development
- Commit to addressing professional and ethical responsibilities, including a respect for diversity
- Commit to quality, timeliness, and continuous improvement

Bachelor's degree students are subject to Vermont Tech's minimum degree requirements. The minimum degree requirements for the Bachelor of Science in Manufacturing Engineering Technology are:

- 6 credits of college English
- 12 credits of mathematics, including MAT 1520 and MAT 2021
- 12 credits of lab-based science, including PHY 1041 and 1042
- 12 credits of arts, humanities, and social sciences
- 12 credits of business and management (6 credits minimum at the 3000+ level)
- 12 credits of electives
- 24 credits of engineering, science, or management courses (12 credits minimum at the 2000+ level)
- 30 credits of manufacturing core courses including or equivalent to:
    - MEC 1011 Design Communication I
    - MEC 1020 Manufacturing Processes
    - MEC 1040 Materials Science & Engineering
    - MEC 1060 Metrology & Inspection Techniques
    - MEC 2040 Computer-Aided Technology
    - MEC 3021 Manufacturing Processes II
    - MEC 3031 Materials Processes
    - MEC 3041 Advanced CNC
    - MEC 4010 Lean Manufacturing
    - MEC 4020 Quality Assurance
    - MEC 4721 Manufacturing Capstone Project

First Year

Fall Semester			Spring Semester		
ENG 1060	Freshman Composition	3	INT 1005	Self, Career, & Culture	3
MAT 1311	Precalculus I	3	MAT 1312	Precalculus II	3
MEC 1010	Intro to Mechanical Engineering	1	MEC 1012	Design Communication II	3
MEC 1011	Design Communication I	2	MEC 1040	Intro to Materials Science/Engnrng	3
MEC 1020	Manufacturing Processes I	2	PHY 1042	Physics II	4
PHY 1041	Physics I	4			
		15			15

Second Year

Fall Semester			Spring Semester		
ELT 2071	Basic Electricity	3	CHE 1031	General Chemistry I	4
MAT 1520	Calculus for Engineering	4	ELE XXXX	AH/SS elective	3
MAT 2021	Statistics	3	ELT 2072	Electronics	3
MEC 1060	Metrology & Inspection Techniques	3	ENG 2080	Technical Communication	3
MEC 2040	Computer-Aided Technology	2	MEC 2071	Machine Design	2
		15			15

Third Year

Fall Semester			Spring Semester		
BUS 2020	Principles of Management	3	BUS 4530	Technical Project Management	3
MEC 1180	Introduction to Welding	3	ELE XXXX	AH/SS elective	3
MEC 2010	Fluid Mechanics & Fluid Systems	3	MEC 2050	Thermodynamics & Heat Transfer	3
MEC 2035	Statics & Strengths of Materials	4	MEC 3041	Advanced CNC Machining	3
MEC 3031	Materials Processes	3	XXX XXXX	Elective	3
		16			15

Fourth Year

Fall Semester			Spring Semester		
BUS 2270	Organizational Communication	3	ELE 3XXX	Upper level AH/SS elective	3
BUS 3150	Production & Operations Mgmnt	3	MEC 4010	Lean Manufacturing	3
MEC 3021	Manufacturing Processes II	3	MEC 4721	Manufacturing Capstone Project	3
MEC 4020	Quality Assurance	3	**Select two**		
XXX XXXX	Elective	3	XXX XXXX	Elective	3
		15			15

Mechanical Engineering Technology (AE)

The educational objectives for graduates of the Associate of Engineering in Mechanical Engineering Technology program include:

- Developing a successful career in the manufacturing, design, specification, installation, testing, operation, maintenance, sales, or documentation of mechanical systems
- Employing strong communication and teamwork skills and participating productively on professional teams of engineers, technicians, managers, and skilled production workers
- Utilizing technical knowledge and skills to effectively design, fabricate, manufacture, and maintain industrial and consumer systems and products
- Continuously developing as a professional; adapting and staying current in their field

A student with an Associate of Engineering in Mechanical Engineering Technology will be able to:

- Apply the knowledge, techniques, skills, and modern tools of mechanical engineering technology to areas such as design and solid modeling; materials and structures; machines and mechanisms; fluids systems; thermal systems; and manufacturing
- Apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge
- Conduct standard tests and measurements and conduct, analyze, and interpret experiments
- Apply creativity in the design of systems, components, or processes appropriate to program objectives
- Function effectively as a member of a technical team
- Identify, analyze, and solve narrowly defined engineering technology problems
- Apply written, oral, and graphical communication in both technical and non-technical environments and identify and use appropriate technical literature
- Understand the purpose of and engage in self-directed continuing professional development
- Recognize the importance of and have a commitment to addressing professional and ethical responsibilities, including a respect for diversity
- Commit to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of ABET, http://www.abet.org

First Year

	Fall Semester			Spring Semester	
ENG 10XX	English	3	ENG 2080	Technical Communication	3
MAT 1311	Precalculus I	3	INT 1005	Self, Career, & Culture	3
MEC 1010	Intro to Mechanical Engineering	1	MAT 1312	Precalculus II	3
MEC 1011	Design Communication I	2	MEC 1012	Design Communication II	2
MEC 1020	Manufacturing Processes I	2	MEC 1040	Intro to Materials Science/Engnrng	3
PHY 1041	Physics I	4	PHY 1042	Physics II	4
		15			18

Second Year

	Fall Semester			Spring Semester	
ELT 2071	Basic Electricity	3	ELE XXXX	AH/SS elective	3
MAT 1520	Calculus for Engineering	4	ELT 2072	Electronics	3
MEC 2010	Fluid Mechanics & Fluid Systems	3	MEC 2050	Thermodynamics & Heat Transfer	3
MEC 2035	Statics & Strengths of Materials	4	MEC 2065	Kinematics & Dynamics	4
MEC 2040	Computer-Aided Technology	2	MEC 2720	Mechanical Projects	3
		16			16

Nursing

While Vermont Tech guarantees direct progression from the PN to the ADN program for qualified students, it cannot guarantee direct progression at the same site at which the PN certificate was obtained. Because of the competitive demand for ADN slots and the limitations of clinical ADN placements in some areas of the state, some students may have to continue their nursing studies at a site other than their first choice or the site at which their PN certificate was obtained.

A student progressing directly from the PN to the ADN level must request their first, second, and third site preferences for ADN education on their Nursing Direct Progress form.

Vermont Tech assigns first priority to students requesting to remain at their PN site in order of GPA. Once ADN slots are filled for any site, Vermont Tech tries to place students at their next highest stated preferences if seats are available. A student whose first preference is to attend an ADN site other than their PN site will be considered for the preferred site only after qualified PN students at that site have been offered an ADN seat.

A student who wishes to take off a semester or more after completing the PN or ADN program may apply for re-admittance to the Nursing program through the regular admissions process, but are not guaranteed admittance.

PN and ADN students must receive a grade of *C+* or better in all NUR courses and a *C or better* in BIO and PSY courses in order to progress in the program. If a student in the last semester of the program does not achieve these grades, they are not allowed to graduate.

Grades lower than the required 75 or 77 are reflected on the transcript with the corresponding letter grade, so credits may be awarded for any grade above an *F*, but the student will not progress or graduate from the Nursing program.

Practical Nursing (C)

The PN program extends over three semesters, August through June. The student learns PN skills through independent study, lectures, demonstrations, and practice in a nursing skills lab. The student also provides patient care under instructor supervision in a variety of healthcare settings.

Upon completion of the program, the graduate is awarded a certificate and may apply to take the NCLEX for Practical Nursing Licensure. The Vermont State Board of Nursing application requires information regarding past history of substance abuse, prior felony convictions, and failure to pay child support or taxes for all graduates. Other states may ask similar questions. It is the Board's responsibility to determine eligibility to sit for the licensure examination and to issue a license to practice. For more information, please refer to http://vtprofessionals.org/opr1nurses

A student with a certificate in Practical Nursing will be able to:

- Employ the nursing process for select clients to maintain, achieve, or regain their optimal level of self-care
- Integrate knowledge of scientific, behavioral, and cultural principles in the care of clients in a variety of settings
- Establish collaborative relationships with members of the nursing and health team
- Maintain confidentiality in a clinical setting and support the use of legal and ethical standards
- Assume the role of a member of an interdisciplinary team
- Provide care which maximizes the self-care potential of individuals across the lifespan in a variety of healthcare settings
- Contribute to the development of a teaching plan for the client with an alteration in basic self-care needs
- Assume responsibility for self-directed, goal-oriented growth

	Fall Semester			**Winter Semester**	
BIO 1030	Nutrition*	3	BIO 2012	Human Anatomy & Physiology II*	4
BIO 2011	Human Anatomy & Physiology I*	4	NUR 0121	Principles & Practices II Lab	4
NUR 0111	Principles& Practices I Lab	4	NUR 1010	Pharmacology for Nursing	3
NUR 1020	The Nurse-Client Relationship	3	NUR 1121	Principles & Practices of Nursing II	5
NUR 1111	Principles & Practices of Nursing I	5	PSY 1050	Human Growth & Development	3
		19			19

	Spring2 Semester	
NUR 0131	Principles & Practices III Lab	4
NUR 1131	Principles & Practices of Nursing III	5
		9

** Prerequisite courses required at all sites except Randolph and Williston*
PN students may not enroll in spring or summer courses until after Spring2 courses are complete
The certificate program includes 495 hours of theory and 630 hours of clinical/lab.

Nursing (ADN)

The ADN program articulates with the PN program and requires two further semesters of full-time study. The twelve clinical credits earned in the PN program do not transfer to the ADN program.

ADN graduates are awarded an Associate of Science in Nursing and may apply to take the NCLEX for Registered Nurses. The Vermont State Board of Nursing application requires information regarding past history of substance abuse, prior felony convictions, and failure to pay child support or taxes for all graduates. Other states may ask similar questions. It is the Board's responsibility to determine eligibility to sit for the licensure examination and to issue the license to practice. For more information, please refer to http://vtprofessionals.org/opr1/nurses

To progress directly from the ADN to the BSN level, a student must:

- Declare their intent to progress on a Change of Program form no later than March 31 of the year in which they wish to progress
- Maintain a minimum cumulative 2.5 GPA through the ADN program
- Obtain licensure as a Registered Nurse during the summer after completing the ADN degree

ADN graduates are prepared to work in a healthcare setting under the supervision of more experienced practitioners.

A student with an Associate of Science in Nursing will be able to:

- Evaluate the plan of care to assist clients with complex healthcare needs to maintain, achieve, or regain their optimal level of self-care
- Select appropriate scientific, behavioral, and cultural principles for the care of clients with complex needs in diverse settings
- Evaluate interpersonal skills in professional practice
- Incorporate behaviors consistent with legal and ethical standards of professional practice
- Assume the role of manager of care within the interdisciplinary team
- Competently deliver nursing care which maximizes the self-care potential of individuals with complex health needs in diverse settings
- Evaluate a comprehensive teaching plan to meet the physical and emotional needs of individuals and groups with common and complex healthcare needs
- Demonstrate accountability for growth as individuals, as members of society, and as professional nurses

	Fall Semester			**Spring Semester**	
BIO 2120	Elements of Microbiology	4	ENG 2080	Technical Communication	3
ELE XXXX	AH elective	3	MAT 1040	Mathematics for Allied Health	2
ENG 10XX	English	3	NUR 2011	Advanced Pharmacology	1
NUR 2010	LPN to RN Transition/Trends in NUR	2	NUR 2130	Principles & Practices of Nursing V	5
NUR 2030	Principles & Practices of Nursing IV	3	NUR 2140	Principles & Practices V Lab	4
NUR 2040	Principles & Practices IV Lab	2	PSY 1010	Introduction to Psychology	3
		17			18

The associate degree program includes 420 hours of theory and 315 hours of clinical/lab.

Nursing (BSN)

The Bachelor of Science in Nursing at Vermont Tech is fully online. Students currently enrolled in the ADN program may continue directly in the BSN program if they maintain a minimum 2.50 GPA and obtain a Registered Nurse license prior to beginning NUR courses in the BSN program.

BSN students must receive a grade of *C* or better in all NUR courses. If a student receives a grade of less than 75, the student is placed on probation but can continue to take classes. They may retake the course once within a one-year period and are removed from probation if they receive a *C* or better in that course. Receiving a grade of *C*- or less in the same course twice or once in two separate courses is grounds for dismissal from the program. The Associate Dean of Nursing reviews such cases for mitigating circumstances and makes final decisions regarding dismissal.

A student with a Bachelor of Science in Nursing will be able to:

- Collaborate with clients, the interdisciplinary team, and multiple care providers when planning care to establish client-centered goals to optimize wellness outcomes and evaluate care plan effectiveness for the individual and community
- Engage applied sciences including scientific, behavioral, psychological, and cultural principles for the care of complex clients that incorporates global appreciation, understanding, and tolerance; design evidence-based practice care, incorporating and participating in qualitative research to generate theory and/or quantitative research to test theory
- Distinguish between experimental positivistic empirical approaches and non-experimental research designs; define strengths, weaknesses, the importance of rigor and replicable findings; statistical analysis; and threats to validity, such as bias
- Determine utilization of collaborative relationships with the health team and the community to facilitate communication of team members to enhance care, promote mentorship, and strategize utilization of technology, embracing diversity while evolving therapeutic communication techniques of presencing and dialogical exchange
- Integrate legal and ethical standards that encompass consideration of potential ethical dilemmas and promote self-integrity as well as consideration of benefit to the community
- Coordinate and co-lead the interdisciplinary team; advocate for clients by compassionately caring for people and families using the art and science of nursing in theoretically-based practice
- Help people flourish and find optimal meaning in their lived experiences, demonstrate sound nursing judgement, utilize critical thinking, develop scholarship, and ascertain how to promote the healthiest possible community
- Maximize patient-centered care by co-creating health with clients, empowering people, facilitating comfort, and incorporating health promotion by synthesizing integration of the simultaneity and totality paradigm
- Design a holistic teaching plan with understanding of the person, health, environment, and nursing
- Continually strive for excellence through ongoing engagement in self-directed lifelong learning with participation as an active member of society in their community; working with or becoming leaders; and developing their professional identity and ability to work with teams to create innovative or evidence-based solutions to problems

Third Year

	Fall Semester			Spring Semester	
MAT 2021	Statistics	3	NUR 3210	Healthcare Systems	3
NUR 3100	RN to BSN: Online Transition	1	PSY 3070	Abnormal Psychology	3
NUR 3110	Nursing Informatics	3	SOC XXXX	Sociology elective	3
NUR 3140	Pathophysiology & Assessment	4	**Select one**		
Select one			NUR 4011	Teaching/Learning in Healthcare	3
NUR 3120	Palliative & End-of-Life Care	3	NUR 4012	Health Promotion Across the Lifespan	3
NUR 3121	Transition of Care in Healthcare Reform	3			
		14			12

Fourth Year

	Fall Semester			Spring Semester	
HUM 2020	Bioethics	3	HUM 4010	East & West Holistic Healing	3
NUR 4110	Research & Evidence-Based Practice	4	NUR 4210	Global Health/Population Healthcare	3
NUR 4130	Nursing Leadership & Management	6	NUR 4410	Community Health	6
		13			12

The BSN program includes 675 hours of theory and 225 hours of precepted time that can be completed in the student's community or work setting.

All BIO *and* NUR *courses and* PSY 1050 *must be completed with a grade of* C *or better to continue in any program; only 35 credits from the PN program count toward cumulative credits. Only non-clinical hours/courses count toward GPA.*

Any student who fails to receive a passing grade in the clinical and/or didactic portion of their final semester Nursing and/or Allied Health course is considered to have failed the program and is not eligible to participate in commencement activities.

Paramedicine (C)

A student with a certificate in Paramedicine will be able to:

- Demonstrate proper affective behaviors when interacting with patients, the public, and member of the health care team
- Perform a comprehensive history and physical examination to identify factors affecting the health and health needs of a patient
- Formulate a field impression based on analysis of comprehensive assessment findings, anatomy, physiology, pathophysiology, and epidemiology
- Relate assessment findings to underlying pathological and physiological changes in the patient's condition
- Integrate and synthesize the multiple determinants of health and clinical care
- Perform health screenings and referrals
- Effectively communicate in a manner that is culturally sensitive and intended to improve patient outcome
- Safely and effectively perform all psychomotor skills within the National EMS Scope of Practice Model and state Scope of Practice at the Paramedic level
- Anticipate and prospectively intervene to improve patient outcome
- Act as a role model of exemplary professional behavior
- Perform basic and advanced interventions as part of a treatment plan intended to mitigate the emergency, provide symptom relief, and improve the overall health of the patient
- Evaluate the effectiveness of interventions and modify treatment plans accordingly
- Report and document assessment findings and interventions
- Collect and report data to be used for epidemiological and research purposes
- Perform a patient assessment, develop a treatment plan, and develop a disposition plan for a patient with a variety of medical and traumatic complaints
- Function as the team leader of a routine, single-patient advanced life support emergency call
- Ensure the safety of the rescuer and others during an emergency
- Assume responsibility for self-directed, goal-oriented growth

First Year

	Fall Semester			Spring Semester	
BIO 2011	Human Anatomy & Physiology I	4	BIO 2012	Human Anatomy & Physiology II	4
EMS 1020	The Art of Paramedicine	2	EMS 1210	Medical Emergencies	4
EMS 1030	Pharmacology & Medication	3	EMS 1230	Cardiology	3
EMS 1040	Airway Management	1	EMS 1240	Paramedic Principles & Practices II	2
EMS 1050	Paramedic Principles & Practices I	2	EMS 1802	Paramedic Field Experience II	1
EMS 1801	Paramedic Field Experience I	1			
		13			14

	Summer Semester	
EMS 1310	OB/GYN & Pediatrics	3
EMS 1320	Trauma Management	3
EMS 1330	Emergency Medical Services Ops	2
EMS 1340	Special Considerations	1
EMS 1350	Paramedic Principles & Practices III	2
EMS 1803	Paramedic Field Experience III	1
		12

Second Year

	Fall Semester	
EMS 1804	Paramedic Field Internship	0

Professional Pilot Technology (BS)

The educational objectives for graduates of the Bachelor of Science in Professional Pilot Technology program include:

- Providing the academic and professional certification needed to achieve success in the dynamic and growing aviation industry
- Providing knowledge of contemporary world-wide aviation industry issues
- Providing specific flying skills to attain FAA certificates and ratings that allow for employment as pilots and flight crew within the international aviation industry
- Enhancing critical thinking and decision-making skills necessary for safe and effective flying
- Providing professional preparation to building a commitment to lifelong learning with a focus on the continuous development of professional skills

A student with a Bachelor of Science in Professional Pilot Technology will be able to:

- Demonstrate the theoretical knowledge and flight skills necessary to attain FAA certificates and ratings in Private, Instrument, Commercial, Flight Instructor, and Multi-Engine as well as training or endorsements in taildragger (conventional gear), aerobatic, high performance, complex, and seaplane aircraft
- Understand and interpret meteorological data to ensure safe and efficient flight operations
- Operate as a crew member
- Function and communicate effectively as part of a multi-disciplinary team.
- Understand leadership roles and step into those roles as a confident leader
- Understand the technological, political, and historical developments constituting the evolution of modern aviation
- Accurately analyze and interpret data from aerodynamic, mathematical, and scientific principles

Completion of the aviation degree entails intensive motivation and commitment. Most pilot certificates or ratings are completed in a 14-week semester. This may require flying 4-5 times each week to complete the courses. As an FAA-approved 141 flight school, the FAA requires stage checks and short written exams for each stage in every course. The Chief Flight Instructor and their assistants are required to follow the published milestones and stage checks for every student to ensure proper completion. The student must make up cancellations or delays on weekends and during scheduled breaks if necessary and must be available to fly seven days per week, including some flights at night.

It is vital to success in the program that the student understands that consequences will incur for noncompliance of all scheduling requests, failure to meet milestones, and stage check failures. If continuous interventions are necessary, the student can expect grade reductions or dismissal from the program. Compliance with all schedules, FAA regulations, and course syllabi is a major part of the training for a career in the field of aviation.

First Year

	Fall Semester			**Spring Semester**	
AER 1005	Introduction to Aviation Careers	3	AER 1110	Pilot Instrument Rating: Ground	3
AER 1010	Private Pilot: Ground	3	AER 1120	Pilot Instrument Rating: Flight	2
AER 1020	Private Pilot: Flight	2	ATM 1032	Aviation Meteorology II	4
ATM 1031	Aviation Meteorology I	3	INT 1005	Self, Career, & Culture	3
CIS 1041	Computer Applications	3	MAT 1311	Precalculus I	3
ENG 10XX	English	3			
		17			15

Second Year

Fall Semester			Spring Semester		
AER 2010	Commercial Pilot: Ground	3	AER 1053	Aerodynamics/Practical Flight Apps	3
AER 2031	Commercial Pilot: Flight Phase I	2	AER 2032	Commercial Pilot: Flight Phase II	2
AER 2110	Safety & Accident Investigation	3	AER 2130	Aviation History	3
BUS 2020	Principles of Management	3	AER 2330	Aviation Physiology & Psychology	3
PHY 1041	Physics I	4	ENG 2080	Technical Communication	3
		15			14

Third Year

Fall Semester			Spring Semester		
AER 3010	Certified Flight Instructor: Ground	6	AER 3110	Aviation Law	3
AER 3020	Certified Flight Instructor: Flight	2	BUS 3250	Organizational Behavior & Mgmnt	3
AER 3030	Human Factors, Risk Mgmnt, CRM	3	ELE 3XXX	Upper level AH/SS elective	3
AER 3040	Aircraft Maintenance for Pilots	3	MAT 2021	Statistics	3
AER 3080	Airline Operations & Management	3	**Select 3 credits**		
			AER 2802	Aviation Fieldwork/Internship	3
			AER 4010	Multi-Engine Land Ground/Flight	0.5
			AER 4011	Multi-Engine Sea Ground/Flight	0.5
			AER 4020	CFI: Instrument Ground/Flight	1
			AER 4030	CFI: Multi-Engine Ground/Flight	1
			ELE XXXX	AH/SS elective	3
		17			15

Fourth Year

Fall Semester			Spring Semester		
AER 4040	Corporate Flying/Business Aviation	3	AER 4050	Training & Flying Adv Airplanes	3
AER 4060	Unmanned Aerial Systems	3	AER 4110	Adv Transport Category Systems	3
AER 4610	Aviation Senior Project II	3	AER 4130	High Alt Nav/Internat'l Flight Ops	3
Select two			ELE XXXX	AH/SS elective	3
ELE XXXX	AH/SS elective	3			
		15			12

Renewable Energy (BS)

A student with a Bachelor of Science in Renewable Energy will be able to:

- Design and manage renewable energy systems and related technologies
- Develop a career path that employs knowledge of science, technology, and management to address energy needs and challenges
- Work as an effective member of a multidisciplinary team using strong graphic and verbal skills to present ideas
- Integrate state-of-the-art knowledge in this rapidly evolving profession

Bachelor's degree students are subject to Vermont Tech's minimum degree requirements. The minimum degree requirements for the Bachelor of Science in Renewable Energy are:

- 6 credits of college English
- 12 credits of mathematics, including MAT 1520 and MAT 2021
- 12 credits of arts, humanities, and social science
- 12 credits of electives
- 16 credits of lab-based science, including PHY 1041, PHY 1042, chemistry, and biology
- 16 credits of engineering courses, including CAD, AC, and DC electrical circuits
- 46 credits of Renewable Energy core courses, including or equivalent to:
    - ARE 2031 Environmental Systems I
    - ARE 2032 Environmental Systems II
    - ARE 3050 Fundamentals of Fluids & Thermodynamics
    - ARE 4030 HVAC Systems
    - BUS 2020 Principles of Management
    - BUS 3250 Organizational Behavior & Management
    - BUS 4530 Technical Project Management
    - MEC 1010 Introduction to Mechanical Engineering Technology
    - MEC 2150 Solar Photovoltaics
    - MEC 3010 Wind Power
    - MEC 3040 Bioenergy
    - MEC 3170 Renewable Heating Systems
    - MEC 4120 Renewable Energy Modeling
    - MEC 4722 Renewable Energy Capstone Project
    - MEC 4802 MEC Internship Review
    - SSC 2030 Energy Systems & Sustainability

First Year

	Fall Semester			Spring Semester	
ENG 1060	Freshman Composition	3	CHE 1031	General Chemistry I	4
MAT 1311	Precalculus I	3	INT 1005	Self, Career, & Culture	3
MEC 1010	Introduction to MEC	1	MAT 1312	Precalculus II	3
MEC 1011	Design Communication I	2	MEC 1012	Design Communication II	2
MEC 1020	Manufacturing Processes I	2	PHY 1042	Physics II	4
PHY 1041	Physics I	4			
		15			16

Second Year

	Fall Semester			Spring Semester	
BIO 1020	Intro to Environmental Biology	4	ELE XXXX	AH/SS elective	3
BUS 2020	Principles of Management	3	ELT 2072	Electronics	3
ELT 2071	Basic Electricity	3	ENG 2080	Technical Communication	3
MAT 1520	Calculus for Engineering	4	MAT 2021	Statistics	3
SSC 2030	Energy Systems & Sustainability	3	MEC 2150	Intro to Solar Photovoltaic Tech	3
		17			15

Third Year

	Fall Semester			Spring Semester	
ARE 2031	Environmental Systems I	3	ARE 2032	Environmental Systems II	3
MEC 2035	Statics & Strength of Materials	4	ARE 3050	Fluids & Thermodynamics	4
MEC 3010	Wind Power	3	BUS 3250	Organizational Behavior & Mgmnt	3
MEC 3040	Bioenergy	3	MEC 3170	Renewable Energy Heating	3
XXX XXXX	Technical elective	3	XXX XXXX	Technical elective	3
		16			16
				Summer Semester	
			MEC 4801	MEC Internship	0

Fourth Year

	Fall Semester			Spring Semester	
ARE 4030	HVAC Systems	4	BUS 4530	Technical Project Management	3
ELE 3XXX	Upper level AH/SS elective	3	ELE XXXX	AH/SS elective	3
MEC 4120	Renewable Energy Modeling	3	MEC 4722	Renewable Energy Capstone Project	3
MEC 4802	MEC Internship Review	1	XXX XXXX	Technical elective	3
XXX XXXX	Technical elective	3			
		14			12

Respiratory Therapy (AS)

This degree is available as either a two-year or three-year program. The three-year curriculum is designed for the student who would like to be enrolled in the program while completing a first year of science, English, math, and other elective requirements for completion of the associate degree.

A student with an Associate of Science in Respiratory Therapy will be able to:

- Meet respiratory care needs in the healthcare community
- Demonstrate the attitudes, skills, and knowledge relevant to their roles as registered respiratory therapists
- Decide whether care is needed, administer the care competently, and determine whether the care provided was effective
- Think critically, use strong communication skills, and demonstrate the leadership required of today's respiratory therapists

First Year

	Fall Semester			Spring Semester	
BIO 2011	Human Anatomy & Physiology I	4	BIO 2012	Human Anatomy & Physiology II	4
ENG 10XX	English*	3	ELE XXXX	AH/SS elective	3
RSP 1010	Foundations of Respiratory Care	3	RSP 1012	Respiratory Care II	4
RSP 1011	Respiratory Care I	5	RSP 1210	Respiratory Anatomy & Physiology	3
Select one:			RSP 1601	RSP Clinical Field Experience I	2
MAT 1210	Principles of Mathematics**	3			
MAT 1221	Finite Mathematics**	3			
MAT 2021	Statistics**	3			
		18			16
				Summer Course	
			RSP 2801	Respiratory Internship	0

Second Year

	Fall Semester			Spring Semester	
BIO 2120	Elements of Microbiology	4	ELE XXXX	AH/SS elective	3
RSP 2011	Cardiopulmonary Disease I	4	ENG 2080	Technical Communication	3
RSP 2013	Respiratory Care III	5	RSP 2012	Cardiopulmonary Disease II	5
RSP 2602	RSP Clinical Field Experience II	4	RSP 2603	RSP Clinical Field Experience III	6
			RSP 2802	Respiratory Internship Review	1
		17			18

Three-Year Option

First Year

	Fall Semester			Spring Semester	
BIO 2011	Human Anatomy & Physiology I	4	BIO 2012	Human Anatomy & Physiology II	4
ENG 1061	English Composition	3	ENG 2080	Technical Communication	3
RSP 1009	Intro to the Profession of RSP	1	**Select one**		
Optional			MAT 1210	Principles of Mathematics**	3
CHE 1020	Introduction to Chemistry	4	MAT 1221	Finite Mathematics**	3
MAT XXXX	Math elective	3	MAT 2021	Statistics**	3
			Optional		
			CIS XXXX	Computer elective	3
		11-15			10-13

Second Year

	Fall Semester			Spring Semester	
BIO 2120	Elements of Microbiology	4	ELE XXXX	AH/SS elective	3
ELE XXXX	AH/SS elective	3	RSP 1012	Respiratory Care II	4
RSP 1010	Foundations of Respiratory Care	3	RSP 1210	Respiratory Anatomy & Physiology	3
RSP 1011	Respiratory Care I	5	RSP 1601	RSP Clinical Field Experience	2
		15			12
				Summer Course	
			RSP 2801	Respiratory Internship	0

Third Year

	Fall Semester			Spring Semester	
RSP 2011	Cardiopulmonary Disease I	4	RSP 2012	Cardiopulmonary Disease II	5
RSP 2013	Respiratory Care III	5	RSP 2603	RSP Clinical Field Experience III	6
RSP 2602	RSP Clinical Field Experience II	4	RSP 2802	Respiratory Internship Review	1
		13			12

** Students must place into ENG 1060 or 1061 and achieve a level 2 math placement in order to be accepted into the program*
*** Students must complete a minimum of one placement level 2 math elective (may be taken in fall or spring)*

All BIO and RSP courses must be completed with a grade of C or better to continue in the program

Technical Education

The Career and Technical Teacher Education Program is an approved Vermont Agency of Education (AOE) alternative educational licensing route for trades and industry teachers at Vermont's secondary regional career and technical centers.

Typically, once a teacher is hired at a regional career and technical center, they enter this three-year program to complete the qualifications for a Vermont Level I Educator License. The teacher-candidate first obtains an apprenticeship license from the AOE, which requires at least a high school diploma and six years of experience in the trades or industry, or an associate degree and at least four years of experience. The teacher-candidate takes education courses and receives support during the next three years from the Career and Technical Teacher Education Program.

The program courses are:

EDU 2051	Teaching Methods I	3
EDU 2052	Teaching Methods I (continued)	3
EDU 2061	Teaching Methods II	3
EDU 2062	Teaching Methods II (continued)	2
EDU 2115	Issues & Trends in Technical Education	3
EDU 2135	Instruction for Students with Special Needs	3
EDU 2650	Education Capstone	1
EDU 2802	Externship I	1
EDU 3550	Technology in the Classroom	1
PSY 2110	Educational Psychology	3
		23

Note: Enrollment in these courses requires the permission of the Program Director.

Undeclared Major

A student who has not decided on a specific program of study and who has met acceptance requirements may be admitted to the college with an undeclared status. Enrollment as undeclared may begin in either the fall or spring semester.

The student who might be interested in this program is one who is uncertain about a major, wants to begin college mid-year, wants a lighter credit load, wants a slower pace, or has other plans for subsequent semesters and should discuss this with their academic advisor.

A student who matriculates as undeclared is expected to select a degree program by the end of their second term. When ready to declare, the student applies for a change of program during the pre-registration cycle for the following term. Acceptance into a degree program is contingent upon space availability and department approval. “Capped” programs are handled through the Office of Admissions. Once in the program, the student must meet all the requirements of that program for graduation.

Enrollment as undeclared is based on placement, student desire, and class availability. Undeclared status also increases the time it takes to complete a degree. No student is eligible to graduate as undeclared and does not have scheduling priority over degree-seeking students.

A minimum of 12 credits are required for full-time status and on-campus residency. Subsequent terms may be scheduled as necessary.

Sample Semesters:

	Fall Semester			**Spring Semester**	
CIS XXXX	Computer elective	2	CIS XXXX	Computer elective	2
ELE XXXX	AH/SS elective	3	ELE XXXX	AH/SS elective	3
ENG 10XX	English	3	ENG 10XX	English	3
MAT XXXX	Mathematics elective	2-5	MAT XXXX	Mathematics elective	2-5
SCI XXXX	Science elective	3-4	SCI XXXX	Science elective	3-4
XXX 1000	Freshman Seminar	1			
		14-18			13-17

Veterinary Technology (AAS)

The matriculated VET student is required to adhere to the policies and procedures set forth in the Vermont Tech Veterinary Technology Student Handbook. These policies include safety issues related to pregnancy, immunizations, and substance abuse. The college strongly recommends that Vet Tech students receive human prophylactic rabies vaccine, which is available through the college (at the students' expense) in the fall semester.

A student with an Associate of Applied Science in Veterinary Technology will be able to:

- Demonstrate competence in veterinary facility management utilizing appropriate professional and client communication skills and maintaining ethical standards according to applicable laws and codes of the veterinary technology field
- Exhibit a technical level of competency in the safe and effective preparation, administration, and dispensation of medications (including controlled drugs) using proper dosage calculations, labeling, and record-keeping
- Demonstrate entry-level skills in patient nursing care for both companion and food animals including husbandry; nutrition; restraint techniques; patient data and sample collection; administration of therapeutics; and basic dental prophylaxis
- Safely and effectively manage patients and associated equipment in all phases of anesthetic procedures
- Integrate all aspects of patient, environment, and equipment management for common surgical procedures in a variety of animal species
- Handle, store, ship, and properly analyze lab specimens
- Safely and effectively produce diagnostic radiographic and non-radiographic images as well as operate and maintain the associated equipment
- Safely and effectively handle and provide care for lab, avian, and exotic animals

The student must satisfactorily complete all AVMA-required tasks for each course to receive a grade in the course.

First Year

	Fall Semester			Spring Semester	
BIO 2320	Zoology	4	CIS 1050	Intro to Spreadsheets	1
ENG 10XX	English	3	VET 1020	Animal Anatomy & Physiology	4
MAT 1210	Principles of Mathematics	3	VET 1040	Animal Diseases	4
VET 1030	Animal Care & Restraint	3	VET 1052	Animal Care II*	1
VET 1051	Animal Care I*	1	VET 1060	Lab Techniques	4
		14			14

	Summer Course	
VET 2801	VET Summer Externship	0

Second Year

	Fall Semester			Spring Semester	
ELE XXXX	AH/SS elective	3	ELE XXXX	AH/SS elective	3
VET 2011	Veterinary Clinical Techniques I	4	ENG 2080	Technical Communication	3
VET 2030	Animal Nutrition	2	VET 2012	Veterinary Clinical Techniques II	3
VET 2050	Applied Lab Methods	4	VET 2040	Reproduction & Genetics	3
VET 2070	Pharmacology & Toxicology	3	VET 2060	Veterinary Office Procedures	3
VET 2720	Veterinary Supervisor*	1	VET 2080	Animal Behavior	2
VET 2802	VET Summer Externship Review	1	VET 2090	Vet Tech National Exam Seminar	1
			Optional:		
			VET 2720	Veterinary Supervisor*	1
		18			18-19

**Must be taken at least once; may be repeated for credit*

BIO 2320 and all VET courses must be completed with a grade of C or better to graduate from the program. Any student who fails to achieve a C or better in any core VET/BIO course after two attempts will be dropped from the program

Returning students who need to repeat courses will be placed in them on a space-available basis

Web Development (AC)

This certificate is designed for the student who has earned an associate degree or higher from an accredited institution and would like to obtain the skills required to develop professional-level websites.

A student with a certificate in Web Development will be able to:

- Demonstrate fluency in an object-oriented programming language
- Develop complete websites
- Understand the concepts and practice of relational databases

To earn a certificate, a student must maintain a cumulative GPA for the entire certificate of at least 3.0. Courses where the final grade is below a *C* do not count toward the certificate, but, with permission of the host department, a subsequent course may be substituted. For a student with a particularly strong background, up to two courses may be waived with department permission.

First Year

	Fall Semester			**Spring Semester**	
CIS 1151	Website Development	3	CIS 1152	Advanced Website Development	3
CIS 2230	System Administration	4	CIS 2450	Advanced Web Technologies	3
CIS 3XXX	Upper level computer elective	3-4	CIS 3010	Database Systems	4
Select one:			**If required:**		
CIS 2261	Intro to Java Programming I	4	CIS 2262	Intro to Java Programming II	3
CIS 2271	Java Programming	4			
		14-15			10-13

Key to Course Subject Abbreviations

ACC Accounting	**ENG** English
AER Aviation	**EQS** Equine Studies
AGR Agriculture & Animal Science	**FSC** Fire Science
AHS Allied Health Sciences	**GTS** Ground Transportation Services
ARE Architectural Engineering Technology	**HIS** History
ATM Atmospheric Sciences	**HUM** Humanities
ATT Automotive Technology	**INT** Interdisciplinary
BIO Biological Sciences	**LAH** Landscape
BUS Business	**MAT** Mathematics
CED Continuing Education	**MEC** Mechanical Engineering Technology
CET Civil & Environmental Engineering Technology	**MUS** Music
CHE Chemistry	**NUR** Nursing
CIS Computer Science	**PHI** Philosophy
CPM Construction Management	**PHY** Physics
DHY Dental Hygiene	**POS** Political Science
DSL Diesel	**PSY** Psychology
ECO Economics	**RSP** Respiratory Therapy
EDU Education	**SOC** Sociology
ELM Electromechanical Engineering Technology	**SSC** Social Science
ELT Electrical Engineering Technology	**VET** Veterinary Technology
EMS Emergency Medical Services	**XXX** Special Topics

Students without the prerequisites for any course must obtain instructor permission prior to enrollment.

Course names in italics are VSC shared courses.

Course Descriptions

Accounting (ACC)

***ACC 1010 Computerized Accounting* (3)** **spring**
This course demonstrates how various accounting systems are implemented and integrated on a microcomputer. The student becomes proficient with applications in general ledger, receivables, payables, inventory, fixed assets, and the preparation of financial statements.
1 hour of lecture, 4 hours of hybrid format lab per week Prerequisite: ACC 1020 or 2121

ACC 1020 Survey of Accounting (3) **fall/spring**
In this course, the student identifies accounts and processes and records typical cash receipts, cash payments, and payroll transactions for a service business and a merchandising business. The student completes a worksheet and prepares and interprets financial statements. The student prepares adjusting and closing entries and understands inventory valuation and depreciation of plant assets. This class is designed for non-Business majors.
3 hours of lecture per week

***ACC 2121 Financial Accounting* (4)** **fall**
This course covers the basics of generally accepted accounting principles, terminology, and the accounting cycle. The student prepares financial statements and becomes familiar with special journals, receivables, payables, control accounts, inventory, depreciation, deferrals, accruals, and payroll.
3 hours of lecture, 2 hours of lab per week

***ACC 2122 Managerial Accounting* (4)** **spring**
This course explores internal accounting systems and the uses of internally generated data in management. Topics include the use of financial accounting data; cost-volume-profit analysis; budgets and responsibility accounting; and cost allocations.
4 hours of lecture per week Prerequisite: ACC 2121

***ACC 2201 Intermediate Accounting I* (4)** **as required**
This course is an in-depth study of current theory and practices regarding cash; investments; receivables; valuation of inventories; current liabilities; acquisition and disposal of property; plant and equipment depreciation and depletion; and intangible assets.
4 hours of lecture per week Prerequisite: ACC 2121

***ACC 2202 Intermediate Accounting II* (4)** **as required**
This course is a continuation of ACC 2201. Topics include long-term investments; long-term debt; stockholders' equity; treasury stock; earnings per share; accounting for income taxes, pensions, and leases; accounting changes and errors; statement of changes in financial position; analysis of financial statements, and accounting for inflation. The course emphasizes methods and procedures and recent changes and developments.
4 hours of lecture per week Prerequisite: ACC 2201

***ACC 2210 Cost Accounting* (4)** **as required**
This course covers the fundamental theories and procedures of cost accounting, emphasizing the planning and control of materials, labor, and overhead. Topics also include job order and process control system; standard costs; activity and responsibility accounting; and variance analysis.
4 hours of lecture per week Prerequisite: ACC 2122

Aviation (AER)

AER 1005 Introduction to Aviation Careers (3) **fall**
This exploratory course demystifies obstacles and presents an overview of aviation career opportunities and surveys the diverse and dynamic aviation world of today as the student visits aviation facilities and speaks to professionals in the field such as air traffic control, aircraft maintenance, and the flight deck of a commercial aircraft. For a student interested in becoming a professional pilot, flight attendant, dispatcher, mechanic, or ground crew, this course offers career path understanding and guidance. An introductory flight may be arranged for those interested in a pilot career and that requires a separate class fee.
3 hours of lecture per week

AER 1010 Private Pilot: Ground (3) **fall**
This course enables the student to gain the necessary aeronautical knowledge to pass the FAA Private Pilot written knowledge exam and oral exams for a Private Pilot certificate with an Airplane category rating and a Single-Engine Land class rating. The course runs concurrently with AER 1020, in which flight skills are learned in simulators and training aircraft.
3 hours of lecture per week Corequisite: AER 1020

AER 1020 Private Pilot: Flight (2) **fall**
This course is one of two that enable the student to gain the necessary aeronautical knowledge, skill, and experience to meet the FAA requirements for a Private Pilot certificate with an Airplane category and Single-Engine Land class rating. AER 1010 must be completed simultaneously with this course. Flight training is on-on-one with a Certified Flight Instructor who teaches basic flight maneuvers, solo flight, navigation with cross-country flying,

and preparing for the FAA oral exam and flight test in accordance with all facets of the FAA Private Pilot Practical Test Standards (PTS). Flight training includes the number of minimum FAA Part 141 FAA-approved flight school simulator and aircraft flight hours to meet performance requirements for an FAA Private Pilot Certificate. The course includes 55 flight hours and all students pay flight fees for each flight course based on the number of hours of the course. After the final hour of flight training, the student receives a grade based on evaluations throughout, including four FAA required Stage Checks (written tests and flight tests) and recorded attendance throughout the semester. The published flight fees do not include the FAA flight test nor the examiner's fees.
55 flight hours per term — Corequisite: AER 1010
[Course fee: $12,655]

AER 1053 Aerodynamics & Practical Flight Applications (4) — **spring**
This course is an algebra- and trigonometry-based course in aerodynamics as it relates to practical flight applications and specifically addressing aviation topics including linear and curved motion studies; kinematics; force; statics; dynamics; work and energy; impulse and momentum; rotary motion; and fluids. Vector analysis plays an important role in developing conceptual models to explain cause and effect. The student conducts investigations, collects data, and interprets the results using graphical analysis. The application of mathematical models to observed events enhances the development and reinforcement of conceptual understanding.
3 hours of lecture, 2 hours of lab per week — Prerequisite: MAT 1311

AER 1110 Pilot Instrument Rating: Ground (3) — **spring**
This course provides the required knowledge and training for a pilot to obtain an instrument rating which qualifies operations under Instrument Flight Rules (IFR). The ground course enables the student to gain the necessary knowledge to meet the requirements to pass the FAA Instrument Rating Knowledge Exam based on Airplane category and a Single-Engine Land class rating. The course focuses on aeronautical knowledge, full procedural aspects of published instrument navigation, and instrument approaches. Topics included relate to attitude flying, radio navigation aids, IFR systems, and partial panel exercise for approaches. The student reviews nearly all FAA test questions to prepare for the required FAA Instrument Rating Knowledge Exam and the FAA Oral Exam for the Instrument rating.
3 hours of lecture per week — Prerequisite: AER 1020
Corequisite: AER 1120

AER 1120 Pilot Instrument Rating: Flight (2) — **spring**
This course provides training for aeronautical skill, knowledge, and procedures, using both AATD simulators and airplanes, to acquire the FAA Instrument Rating: Airplane. It is offered concurrently with AER 1110 and builds skills of basic attitude flying, navigation, and air traffic control phraseology in the instrument (IFR) environment. The student experiences flight solely by reference to instruments by first training in advanced training devices, followed by airplane training while wearing a vision-limited hood or by flying in actual instrument conditions with instructors. Full training in instrument navigation on cross-country trips with multiple instrument approaches is conducted. This course achieves an FAA Instrument: Airplane rating added to the student's pilot certificate. Training is conducted in flight stages with stage exams until completion. The course consists of 52 flight training hours and all students pay the same flight fees, which are based on the number of flight hours.
52 flight hours per term — Prerequisite: AER 1020
[Course fee: $12,334] — Corequisite: AER 1110

AER 2010 Commercial Pilot: Ground (3) — **fall**
This course is the first of three that enable the student to gain the necessary aeronautical knowledge, skill, and experience to meet the FAA requirements of a Pilot Commercial certificate with an Airplane category and a Single-Engine Land class rating. AER 2031 must be completed simultaneously with this course. AER 2032 must be completed in the subsequent semester to earn the FAA Commercial Pilot Certificate. Emphasis is on advanced knowledge, regulations, and performance expectations for these higher-level flight skills.
3 hours of lecture per week — Prerequisite: AER 1020 with FAA Instrument Rating certificate
Corequisite: AER 2031

AER 2031 Commercial Pilot: Flight I (2) — **fall**
This course is the second of three that enable the student to gain the necessary aeronautical skill, knowledge, and experience to meet the requirements of a Pilot Commercial certificate with an Airplane category and a Single-Engine Land class rating. AER 2010 is completed simultaneously with this course. AER 2032 is completed the subsequent semester to earn the FAA Commercial Pilot certificate. The subject material in both courses this semester is essentially identical, the difference being comprised of where and how the student learns or applies content and both dual instruction and solo flying are included in both. The student has the option of a variety of training and endorsements including seaplane (SES), taildragger, high performance, complex, aerobatic training, and upset recovery.
85 flight hours per term — Prerequisite: AER 1120
[Course fee: $17,923] — Corequisite: AER 2010

AER 2032 Commercial Pilot: Flight II (2) — **spring**
This course is the final of three that enable the student to gain the necessary aeronautical knowledge, skill, and experience to meet the requirements of the Commercial Pilot certificate with an Airplane category with a Single-Engine Land and added Sea class rating. The course is practice-intensive to build skills with flight time. However, the applicant's cumulative flight time must reach the minimum to be eligible for a Commercial Certificate under

Part 141 regulations.
120 minimum total flight hours Prerequisite: AER 2031
[Course fee: $8,909]

AER 2110 Aviation Safety & Accident Investigation (3) fall
This course provides the student with a fundamental understanding of safety factors in aviation operations and sufficient knowledge to prepare for safety components of advanced FAA certifications throughout their careers. The student uses actual NTSB accident reports to explore, analyze, and discuss the complex and interacting factors involved with aircraft accidents and incidents, as well as the methodology of subsequent investigation. The course gives particular attention to safe operation of small aircraft, managing distractions, communications, attitudes towards safety, and cultivating a firm commitment to safe operations at all times. The student attends at least two FAASTeam safety seminars during the semester.
3 hours of lecture per week

AER 2130 Aviation History (3) fall
This course explores the history of aviation from its earliest concept and first practical flying machines to war birds, airliners, and present day aircraft. The student learns about the evolution of aviation technology such as engines, aircraft materials, and aerodynamics. In addition to technical aspects, this course covers important historical figures, explores their personalities, and explains why and how they became fixtures in history. General world history is covered to provide a contextual background and to further enhance student understanding of how aviation has shaped our world. Course materials are presented by lecture; class discussions; presentation of films and other media; student presentations; team-based historical knowledge games; and hands-on examination of primary documents and artifacts.
3 hours of lecture per week

AER 2330 Aviation Physiology & Psychology (3) spring
Pilots have unique mental and physical demands that are critical for their safety-sensitive roles in ensuring safety and passenger comfort. This course focuses on the need for awareness and understanding of these demands as well as the responsibility to ensure compliance from both a regulatory and ethical standpoint. The physiologic component focuses on general health with emphasis on altitude physiology, vision, hearing, medications, and fitness. The psychological component emphasizes aeronautical decision-making (ADM), risk management, sleep, and fatigue. Both are integrated into a discussion of the FAA medical certification process and pilot duties and responsibilities of compliance. The student is required to select an aviation accident or incident and lead a class discussion that applies these concepts to a specific actual event.
3 hours of lecture per week

AER 2801 Aviation Fieldwork/Internship (3) spring
In this career experience-focused course, the student has the opportunity to get hands-on professional experience either as pilots, flight instructors, or in related employment with aviation community partners, while receiving the guidance and mentoring of a faculty member who is also a professional in the field. The student logs actual fieldwork hours and completes weekly briefings of learning goals that have been accomplished and self-evaluations. The student must attend at least one professional development workshop, career fair, or conference and complete a briefing on what was learned and what professional development and affiliates would be useful in the future. Upon completion of the course, the student presents an evaluation from the fieldwork supervisor and at least two letters of recommendation to be used for future employment.
3 hours of internship per week

AER 2802 Aviation Fieldwork/Internship (3) spring
In this career experience-focused course, the student has the opportunity to get hands-on professional experience either as pilots, flight instructors, or in related employment with aviation community partners while under the guidance of a faculty member who is a professional in the field. The student logs actual fieldwork hours and completes weekly briefings of learning goals that have been accomplished and self-evaluations. The student must attend at least one professional development workshop, career fair, or conference and complete a briefing on what was learned and what professional development and affiliates would be useful in the future. Upon completion of the course, the student presents an evaluation from the fieldwork supervisor, two letters of recommendation to be used for future employment, and a presentation of their work.
3 hours of internship per week Prerequisite: Department permission

AER 3010 Certified Flight Instructor: Ground (6) fall
This capstone course builds upon the student's extensive knowledge of the aspects of being a Commercial Pilot by adding the instructional skills of a Professional Flight Instructor. Strong emphasis is placed on the fundamentals of instructing and scenario-based teaching. Through the creation of weekly lesson plans delivered in the classroom with peers and in the broader community, the student builds confidence in their aviation knowledge and delivery. The student explores and gains an understanding of their own learning and teaching styles as well as how to recognize and support individual learners. Upon completion, the student is prepared to complete aircraft flight instruction with a senior CFI and to step into their first job as a professional flight instructor.
6 hours of lecture per week

AER 3020 Certified Flight Instructor: Flight (2) fall
This hands-on capstone course results in a Certified Flight Instructor: Airplane certificate issued by the FAA. This

authorizes the student to train pilots as a professional while receiving income and building Pilot-in-Command flight time. The student can expect at least two flight-related events every week. AER 3010 runs concurrently with this course and brings the student to a professional instructional delivery level through practice and perfection of skills needed to teach others to fly. Flight training consisting of 25 flight hours total as required by FAA 141 standards and gives all students ample time for knowledge, rehearsal, and practice in applying their skills through observation and critique. Published flight fees are based on the number of flight hours for all flight courses and all students.

25 flight hours per term — Prerequisite: Commercial Pilot certificate ASEL and Instrument Rating
[Course fee: $6,723] — Corequisite: AER 3010

AER 3030 Human Factors, Risk Management, Crew Resource Management (3) **fall**

As professionals in a global aviation world, pilots are expected to demonstrate skills such as resiliency, critical thinking, leadership, decision-making, and stress management. The study of human factors and crew resource management offers the student the opportunity to develop into their personal best as a pilot and as an essential part of a professional team. Using the latest research and training techniques from the airlines and FAA programs, the student learns to use Threat and Error Management (TEM), Single Pilot Resource Management (SPRM), and Crew Resource Management (CRM) as an integral part of their training and flying.

3 hours of lecture per week — Prerequisite: Commercial Pilot certificate, Instrument Rating

AER 3040 Aircraft Maintenance for Pilots (3) **fall**

In this course, the student gets in-depth, hands-on experience learning the mechanics of aircraft systems and components. Through practice in an approved aircraft and power plant maintenance training facility, the student becomes familiar with the tools for performing FAA-approved pilot maintenance tasks. The class covers the specific Federal Aviation Regulations (FARs) which govern pilot maintenance and the student keeps a maintenance log of their work. The student gains an understanding of how to do a write-up of a faulty or inoperative system and how to communicate effectively with mechanics as they manage the maintenance and repair of the aircraft for which they are responsible.

2 hours of lecture, 1 hour of lab per week
[Course fee: $100]

AER 3080 Airline Operations & Management (3) **fall**

In this course, the student obtains a broad perspective of airline operations and management. Topics include the role of air transportation in global economic development; alternative strategic approaches to route structure and product design; fleet selection; finance; and revenue management. Distribution systems including the role of travel agencies, freight forwarders, global distribution systems, and internet portals are explored. The regulatory foundation of international aviation and the effects of liberalization, privatization, mergers, and emerging global alliances all receive attention.

3 hours of lecture per week

AER 3110 Aviation Law (3) **spring**

This course provides professional guidance on aviation law to pilots, managers, mechanics, aircraft owners, controllers, and others. The focus is on understanding how the legal system works in relation to aviation, including administrative agency regulations and decision-making based on Federal Aviation Regulations (FARs). FARs, in particular, establish standards of legal behavior to which professionals are held accountable and virtually all aspects of aviation in the United States are affected by FARs. Given the ease with which civil aircraft cross national borders as part of transportation's key role in today's global economy, the course also covers international concerns controlled by the Chicago Convention and its several Annexes published by the International Civil Aviation Organization (ICAO). Every professional pilot needs to be able to recognize and avoid common legal pitfalls and to discern when they need to call a lawyer. Current statutory and regulatory changes are emphasized. The student is taken through many real-life scenarios and discussions to give a vivid experiential basis for decision-making in their aviation careers.

3 hours of lecture per week

AER 4010 Multi-Engine Land Ground/Flight (0.5) **spring**

An FAA Multi-Engine rating gives a competitive advantage for seeking employment within any part of the commercial aviation sector. From the fundamentals of flying multi-engine aircraft and the aerodynamic laws that govern multi-engine flight to the challenging task of learning the related aeronautical knowledge, the student becomes a proficient and knowledgeable multi-engine pilot. Instruction takes the student up to the skill levels necessary to earn a Multi-Engine Land rating. The student has access to reprints of applicable FAA advisory circulars and source material for further study on all aspects of multi-engine training. The course is all hands-on flight time, tutoring with expert flight instructors and observing peers in the cockpit or in a simulator. The student practices to proficiency under dual instruction only for all multi-engine training and masters the content for their added rating to their Commercial Pilot certificates and Instrument ratings.

10 flight hours per term — Prerequisite: AER 3020
[Course fee: $5,374]

AER 4011 Multi-Engine Sea Ground/Flight (0.5) **spring**

An FAA Multi-Engine Sea (MES) rating gives a further competitive advantage for seeking employment within any commercial aviation operation that operates seaplanes or amphibians. From the fundamentals of flying multi-engine aircraft and the aerodynamic laws that govern multi-engine flight to the challenging task of learning

related aeronautical knowledge, the student becomes a proficient and knowledgeable multi-engine sea pilot. The instruction of this course takes the student up to the skill levels necessary to earn a Multi-Engine Sea rating. The student has access to reprints of applicable FAA advisory circulars and source material for further study on all aspects of multi-engine sea training. The course is all hands-on flight time tutoring with expert flight instructors and often observing peers in the cockpit or in a simulator. The student practices to proficiency under dual instruction (up to 7.5 hours in a multi-engine seaplane or an amphibian) that covers sea training and masters the content for this added MES rating to the Commercial Pilot certificate.
7.5 flight hours per term — Prerequisite: AER 3020
[Course fee: $4,968]

AER 4020 Certified Flight Instructor: Instrument Ground/Flight (1) — **spring**
In this course, the student applies pilot skills gathered throughout the program and learns how to become an instrument instructor using their skills as a flight instructor to teach instrument flying to students who then attain instrument ratings. This course adds the Instrument Instructor rating to their Certified Flight Instructor certificate and is one of the three ratings the student receives on their CFI in the aviation program. When completed, the new FAA certification is Certified Flight Instructor: Instrument Airplane, also known as the Double I rating.
15 flights hours per term — Prerequisite: AER 3020
[Course fee: $4,883]

AER 4030 Certified Flight Instructor: Multi-Engine Ground/Flight (1) — **spring**
In this course, the student applies pilot skills gathered throughout the program and learns how to instruct the requirements necessary to train pilots for Multi-Engine Ratings. The course assumes the student is already a skilled pilot with the basic Certified Flight Instructor: Airplane credentials, so the emphasis is on honing instructional skills learned during all of their pilot courses to train pilots on multi-engine aircraft. At the end of the course, the student receives their CFI: Multi-Engine rating. This course is one of the final capstone skill sets and certifications that gives the student an important advantage towards landing a job as a fully-qualified Flight Instructor or Commercial Pilot.
25 flight hours per term — Prerequisite: AER 4010
[Course fee: $11,374]

AER 4040 Corporate Aviation & Career Preparation (3) — **fall**
In this course, the student gets a broad perspective on the aviation business and corporate flying world including equipment choices and operations; support services; and airports. The focus is on the culture and operational differences in aviation businesses such as charter, corporate, fractional, and owner-flown operations. The student studies operational costs and slim margins on both career stability and safety and gets a perspective on the opportunities and methods for pursuing a career within the array of options available. The student experiences the steps needed to apply for jobs, network, customize an aviation resume, complete job applications, and be a successful interviewee, and discover the kinds of ethical dilemmas they may face in their career along with tips on how to respond effectively to pressure to compromise safety, personal values, or income.
3 hours of lecture per week — Prerequisite: Senior standing

AER 4050 Training & Flying Advanced Airplanes (3) — **spring**
The student completes a more advanced study of the aerodynamics of flight, flight systems, and aircraft design in this course. The student better understands how the characteristics of different systems affect performance in each phase of flight and gains insight on the rapidly accelerating pace of change including advanced wing design, alternative fuels, and new aircraft and engine materials. The student prepares for their first professional ground school on an advanced aircraft by utilizing a specific aircraft Computer Based Training program (CBT). The student correlates their knowledge by studying real FAA Airline Transport Pilot test questions.
3 hours of lecture per week — Prerequisite: Senior program standing or instructor permission

AER 4060 Introduction to Unmanned Aerial Systems (3) — **fall**
This course provides a general understanding of Unmanned Aerial Systems (UAS) (aka “drones”), the components of those systems, how they interact, and how they are used. It includes a comprehensive introduction to all of the elements of a complete UAS. Topics addressed include the air vehicle; planning and control; mission payloads; data links; launch and recovery concepts; and ethical and legal issues associated with UAS operations.
3 hours of lecture per week

AER 4110 Advanced Transport Category Systems (3) — **spring**
A prospective airline pilot goes through extensive screening in the employment process that proves their potential to command a jet aircraft. Knowledge of complex systems and operational limits of technical aircraft is essential to success as a professional airline pilot. This course specifically deals with the technology of flight found in modern advanced commercial airline aircraft, both turbofan and turboprop.
3 hours of lecture per week
[Course fee: $200]

AER 4130 High Altitude Navigation/International Flight Operations (3) — **spring**
At the high altitudes used by commercial carriers in international operations, unique rules and navigation requirements apply. This course prepares the student to fly in a global world. The student explores standard airline operations in the North Atlantic and Pacific Track systems, including flight planning, oceanic control sectors, clearance communications, plotting, track entry/exit, and required position or event reports. The student stud-

ies hazardous weather and global weather support services and learns the special requirements governing communications, operations, and reporting related to emergency and diversion procedures. Included is a study of ICAO procedures and how they differ from domestic operations. The student works with a team to plan an international ferry flight.
3 hours of lecture per week Prerequisite: AER 3020, 4050

AER 4610 Aviation Senior Project (3) **fall**
In this course, the student applies what they have learned in the Professional Pilot Program to an aviation project selected, planned, implemented, approved, and presented by a specific project team. Under the guidance and supervision of skilled faculty and community experts, the student augments their experience with new learning in group-based project management skills, including planning, teamwork, problem-solving, leadership, and time management. Each student has the opportunity to assume different roles and responsibilities on the project. They are graded by a review of community partners and peers.
3 hours of lecture per week Prerequisite: AER 2610; senior standing

Agriculture & Animal Science (AGR)

AGR 1062 Timber Harvesting (4) **spring**
Through this course, the student gains an understanding of timber harvesting equipment operation, maintenance, and safety. The student assesses land for proper skid trails, landings, and access and erosion control. Harvesting ethics and laws such as trespassing are discussed. The student learns how to find land boundaries using tax maps.
3 hours of lecture, 3 hours of lab per week

AGR 1011 Agricultural Techniques I (1) **fall**
This course facilitates a successful transition to college and focuses on four primary areas: orientation to the college and academic programs; development of basic agricultural skills; interpersonal development; and an introduction to agriculture-related careers. In an informal lab, the student is exposed to the practical skills necessary to succeed within the agricultural curriculum under the supervision of experienced farm staff. The student is introduced to student rights and responsibilities; learns how to interact with faculty and classmates; explores agricultural careers; learns good time management; and learns how to enhance academic performance.
2 hours of lab per week, plus weekly required farm work experience

AGR 1012 Agricultural Techniques II (1) **spring**
This is a continuation of AGR 1011 in which the student must select an area for independent study through a work experience project. The student works closely with the farm staff to complete their selected topic during the semester.
2 hours of lab per week, plus weekly required farm work experience

AGR 1030 Animal Reproduction & Genetics (3) **spring**
In this course, the student develops knowledge of the anatomy and physiology of the male and female reproductive systems and the estrous cycle in farm animals. The course includes an understanding of simple Mendelian and quantitative genetic principles. The student develops sound breeding and selection systems.
3 hours of lecture per week

AGR 1050 Livestock Production (3) **fall**
This course focuses on the study and discussion of livestock applicable to the New England agricultural industry. Cell biology, beef cattle, sheep, swine, poultry, and horses are covered. Breeding, feeding, and management topics are presented in a technical and practical manner.
3 hours lecture per week

AGR 1061 Burls to Boards (3) **fall**
In this course, the student learns the principles of tree harvesting for wood product production. Choosing, cutting, skidding, and milling of common types of lumber in Vermont are discussed and practiced. Upon completion, the successful student can manage small woodlots for efficient personal production of lumber product.
2 hours of lecture, 3 hours of lab per week Prerequisite: AGR 1011 or instructor permission

AGR 1511 Hard & Ice Cider Production (1) **as required**
This course covers the scientific and practical aspects of cider making, fermenting, and chilling cider into commercial beverages. The marketing and cash flow aspects of cider production and processing are also discussed.
0.5 hours of lecture, 1.8 hours of lab per week
[Course fee]

AGR 1512 Meat Processing & Merchandising (1) **as required**
This course gives the beginning student an understanding of the workings of a meat processing facility including meat cutter safety and meat safety; stages of carcass breakdown; meat packaging and presentation; and primal breakdown to retail cuts.
1 hour of lab per week
[Course fee]

AGR 1513 Poultry Processing (1) **as required**
This course gives the beginning student the understanding of the workings of a poultry processing facility includ-

ing humane poultry slaughter; plucking; removal of organs; trimming, cutting, and boning; poultry products; plant sanitation; and poultry packaging.
1 hour of lab per week
[Course fee]

AGR 1801 Forestry Internship (3) **as required**
Through this course, the student gains an understanding of the wood and timber industry. Based on interest, the student has the opportunity to work as an intern at a variety of wood-based industries. The experience could range from a lumber yard with scaling, a sawmill, a pellet business, a maple syrup operation, or a consulting or county forester.
2 hours of lecture, 6 hours of internship per week

AGR 2011 Dairy Herd Management I (4) **fall/spring**
This course covers the skill sets necessary for the operation and construction of a modern dairy farm. The student evaluates facilities and operations for performance. The student learns the environmental, biological, and physical factors necessary for the production of high quality milk and evaluates milk harvesting equipment and practices to make recommendations. The course discusses the materials used for animal housing and all of the aspects of a highly functional animal environment. Farmstead planning and basic structural concepts for farm buildings are emphasized. Subtopics include construction materials and methods, environmental issues, waste management, and feeding systems.
3 hours of lecture, 2 hours of lab per week Prerequisite: AGR 1030, 2030; LAH 1050 or instructor permission

AGR 2012 Dairy Herd Management II (2) **fall/spring**
This course covers the soft skills necessary for the operation of a modern dairy farm. The student synthesizes specific dairy knowledge into farm operational plans using multiple case studies and models and learns and discusses the habits necessary for the operation of a modern dairy farm. Young stock rearing is discussed in detail.
4 hours of lab per week Prerequisite: AGR 2011

AGR 2030 Animal Nutrition (4) **spring**
This is a course in the fundamentals of livestock feeding. It includes the study of the nutritive characteristics of forages, grains, and grain products as feeds for different farm animals. The student develops livestock rations and feeding programs based on the available feedstuffs and needs for maintenance, growth, and production. Typical applications may center on the college's dairy herd or the student's home farm.
3 hours of lecture, 2 hours of lab per week for the first half of the term

AGR 2040 Forage Production (3) **fall/spring**
In this course, emphasis is given to the production of forage and pasture crops for New England dairy farms. Topics include the selection of adapted crops, varieties, seed mixtures, and soil sites, along with soil preparation, seeding methods, and crop management. Harvesting for best digestible energy and protein is stressed as is the growing of alfalfa and corn.
2 hours of lecture, 2 hours of lab per week for the first half of the term

AGR 2050 Large Animal Diseases (3) **fall/spring**
This course includes discussion of those diseases which are of major importance in the husbandry of food animals, with special emphasis on herd and flock health. To further the student's understanding of diseases and disease prevention, basic pathological changes and immunological processes involved in the occurrence and prevention of disease are described.
3 hours of lecture per week

AGR 2060 Beef Production (2) **spring**
This is an introductory course in beef production that addresses topics including: marketing and price-making forces; the biological cycle of the beef cow; beef genetics; and the application of genetic principles to beef herd breeding programs. Reproductive management of cows, bulls, and heifers; principles of nutrition; and animal health issues are also discussed. Offered every other year.
1 hour of lecture, 2 hours of lab per week

AGR 2070 Sustainable Vegetable & Fruit Production (4) **summer**
In this course, the student learns the technical skills needed to be a successful vegetable and fruit producer. Most students take this course after their first year of agricultural education. If a student takes this course prior to their first year, it inspires their classroom learning experience. This summer course gives the student the opportunity to put academic knowledge to work. The student learns about organic management of fruits and vegetables ranging from pest and disease control to washing and handling practices and is introduced to field cultivation and management techniques. They have the opportunity to use and be introduced to the appropriate equipment used on vegetable and fruit farms and get hands-on experience with managerial aspect of farming.
8.5 hours of lab per week

AGR 2110 Sheep Production (2) **as required**
This is an introductory course in sheep production, including a presentation of intensive and extensive production models; life cycle management of the ewe; flock health and parasite control; ram health and fertility; and management of reproduction. Methods for measuring and monitoring flock performance are also presented.
1 hour of lecture, 2 hours of lab per week

AGR 2260 Dairy Financial Management (3) **fall/spring**
This course has three primary objectives. First, it builds on the knowledge from the basic course in accounting. The student applies tools learned in this course to develop a conceptual and analytical understanding of financial management. Second, it utilizes student QuickBooks access to employ the financial decisions that are deemed necessary for the farm. This includes Accounts Receivable and Accounts Payable in real time as incurred and as per additional assignments. Finally, this course emphasizes managerial decision-making techniques as they relate to dairy farms in general.
2 hours of lecture, 2 hours of lab per week Prerequisite: ACC 1020 or 2121

AGR 2510 Brewing: Science, Safety, Sensory, & Skills (3) **as required**
This course introduces the science, art, and practical essentials of producing quality beer. The student gets a grain to glass overview of the brewing process, including daily observations and hands-on training on the Guild's full-scale brewing system and laboratory with structured sensory training sessions. The student learns the essentials of brewing quality beer and discusses the brewing industry and craft beer's position in that industry. Brewery tours are included.
2 hours of lecture, 2 hours of lab per week
[Course fee]

AGR 2511 Direct to Market Dairy Husbandry (2) **as required**
In this course, the student learns the taste and quality effects that animal husbandry and milk processing techniques have on the biological properties of milk. The student learns how to manipulate and control nutrition to affect milk taste and quality and how husbandry affects both. The student learns how to harvest and handle milk for maximum quality and taste and learns the basics of milk testing and processing and the correlation between test results and milk quality.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 2512 Distilling & Spirits Production (2) **as required**
In this course, the student learns about distilling, fermenting, and the production of a variety of spirits, particularly as related to Vermont's agricultural products. The student gains enough breadth and depth of knowledge to know what is involved in establishing, running, and working in a distillery, including basic science and operations involved in production and product quality; licensing and permitting; various business models; and basics of marketing and distribution.
1 hour of lecture, 3 hours of lab per week
[Course fee]

AGR 2513 Honey Production (2) **as required**
In this course, the student learns the history and biology of beekeeping; the threats, perils, and diseases of bees; the equipment necessary for beekeeping and their assembly; honey production and processing; and the marketing, economics, and food safety aspects of honey production in Vermont.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 2514 Wildcrafting: Wild Mushroom Gathering (2) **as required**
In this course, the student learns the concept, ethics, historical uses, and environmental impact of collecting wild and introduced mushrooms while learning the correct techniques of botanical identification, harvesting, handling, and marketing, including state and federal regulations.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 2515 Organic Dairy Production (2) **as required**
This course provides information on the practical and theoretical aspects of organic dairy production and is primarily geared towards meeting the needs of farmers considering commercial-scale production.
1 hour of lecture, 3 hours of lab per week

AGR 2516 Small Grain Production (3) **as required**
In this course, the student learns the history and biology of small grain production in Vermont and gain practical understanding and experiences with all aspects of production, harvest, storage, safe utilization, and economics of small grain production.
1.8 hours of lecture, 3 hours of lab per week
[Course fee]

AGR 2517 Wildcrafting (2) **as required**
In this course, the student learns the concept, ethics, historical uses, and environmental impact of collecting wild and introduced plants and mushrooms while learning the correct techniques of botanical identification, harvesting, handling, and marketing, including state and federal regulations. These are foundational skills, which once mastered, are applicable to a wide variety of wild plants and wild mushrooms. A total of ten wildcrafted items are covered.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 2518 Yogurt Production (2) **as required**
In this course, the student learns food safety issues, fermentation science, and specific, hands-on methods of yogurt production. The student also learns applicable Vermont and federal laws and builds cash flow worksheets for yogurt production.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 2519 Essential Principles & Practices of Cheese-making (2) **as required**
This course covers the fundamentals of cheese-making, quality control practices, and useful considerations in starting a small-scale cheese-making business.
1 hour of lecture, 2 hours of lab per week
[Course fee]

AGR 3020 Advanced Livestock Production (3) **spring**
In this course, the student learns the reproduction, nutrition, housing, and financial requirements of profitable Vermont livestock operations. Swine, poultry, and small ruminant dairy are covered in detail. Emerging livestock production including camelids, meat goats, ostriches, and emus are covered. Offered every other year.
3 hours of lecture per week Prerequisite: AGR 1030, 1050, 2030

AGR 3030 Advanced Dairy Cattle Nutrition (3) **spring**
This is a course in the advanced topics of dairy cattle feeding and includes the study of the nutritive characteristics of forages, grains, and grain products as feeds for dairy cows at different stages of their life cycle (growth, lactation, pregnancy). The student develops dairy diets and feeding programs based on the available feedstuffs and the needs for maintenance, growth, and production. Typical applications may center on the college's dairy herd or the student's home farm.
2 hours of lecture, 2 hours of lab per week Prerequisite: AGR 2030; CHE 1020 or 1031

AGR 3040 Maple Production: Science & Practice (3) **spring**
Current information relating to all aspects of maple production is presented. Principles and practical application of sugarbush management; sap production; maple production facilities and equipment; maple syrup production; product packaging and marketing; and operator safety are covered. Offered every other year.
2 hours of lecture, 2 hours of lab per week Prerequisite: BIO 1220; LAH 1050

AGR 3050 Advanced Nutrient Management (3) **spring**
This course discusses the management of plant requirements for maximum production of plant crops. Special emphasis is placed on nutrient budgeting and use of manure-based fertilizers. The student interprets soil tests and makes recommendations for soil amendments that benefit the farmer and the environment.
3 hours of lecture per week Prerequisite: CET 2110 or LAH 1050

AGR 3110 Apples, Berries, & Bees (3) **fall**
The production requirements of apples, common berries, and honey bees are discussed in this course. Plant or species selection, growing requirements, disease prevention, and harvesting are discussed for each. The successful student can feel confident managing production of each of these agricultural products. Offered every other year.
3 hours of lecture per week Prerequisite: AGR 3050; BIO 1220

AGR 3111 Vegetable Production (3) **spring**
This course deals with the principles, production, management, and handling of vegetable crops, in the context of today's commercial production systems.
3 hours of lecture per week Prerequisite: BIO 1220, instructor permission

AGR 3510 Cold Climate Viticulture (4) **as required**
In this course, the student learns about cold climate viticulture and grape chemistry. The course gives the student hands-on operational experience along with the microbiology and chemistry behind managing a successful vineyard and producing high-quality grapes. The course is broken into four seasonal sessions: winter, spring, summer, and fall. The student learns vineyard establishment and development with a focus on pruning, varietal selection, and business planning. The student looks at vineyard operations in relation to soils, site selection, and the benefits of cover cropping and studies the science behind viticulture through pest and disease management and plant physiology. The course culminates with the chemistry of grapes and wine science.
3.5 hours of lecture, 2 hours of lab per week
[Course fee]

AGR 4040 Agricultural Products (3) **fall**
The course explores the basic processing methods, laws pertaining to the sale of, and common marketing methods for the most common Vermont farm products including: milk, maple, vegetables, fruits, cheeses, and meats.
3 hours of lecture per week

AGR 4801 AGR Senior Summer Internship (0) **summer**
The student spends a minimum of 45 hours in an agriculture setting. Student experiences should include grazing animals, farm machinery, plant and animal production. Pass/No Pass.
Prerequisite: Department permission

AGR 4802 AGR Senior Summer Internship Review (1) **fall**
The student must document and communicate their summer internship experience with grazing, machinery, plants, and animals. Pass/No Pass.
[Course fee: $250] Prerequisite: AGR 4801

Allied Health Science (AHS)

AHS 2011 Emergency Medical Service (5) **fall**
This course follows the guidelines of the National Medical Service Blueprint for Education with approval and oversight by the Vermont Department of Health. The course focuses on the assessment and management of medical emergencies and trauma in the prehospital environment. It provides a foundation for understanding anatomy, physiology, pathophysiology, and emergency medical service operations through a series of lecture, small group activities, and skill labs. The course prepares the student to test for licensure with the National Registry of Emergency Medical Technicians (NREMT) through the Vermont Department of Health. Successful completion of this course and licensure as an Emergency Medical Technician through the NREMT is required to graduate from the VTC Fire Science program. Those who are unable to attain certification with the course guidelines and time frame are given an incomplete grade and must attain certification in the proscribed time period. If the student is still unable to attain certification, a failing grade is given for the course and the student has to attain the certification outside of the VTC Fire Science program. The exam is computer-based. If the student is licensed under a Vermont EMS organization, the exam is $70. Each subsequent exam is $70. Pass/No Pass.
4 hours of lecture, 4 hours of lab per week
[Course fee: $200]

AHS 2035 First Aid & CPR (2) **spring**
This course introduces first aid directed toward the basic principles of assessment and treatment of injury in the workplace. Scenarios and practice in outdoor and indoor workplace settings are included. The successful student can provide first responder stabilization, treatment, and CPR.
4 hours of studio per week
[Course fee: $75]

Architectural Engineering Technology (ARE)

ARE 1000 Freshmen Seminar (1) **fall**
This course provides a forum for the first-year student to learn about the program and about the architectural and engineering professions and the building construction industry. Skills that assist the student in having a successful experience at the college are also discussed.
1 hour of seminar per week

ARE 1011 Introduction to Construction Drawing Practices (3) **fall**
This course covers basic instruction in architectural and engineering construction graphics utilizing hand drawing equipment and CAD software, as well as an introduction to the materials of residential construction. A set of drawings for a small residence is developed in keeping with contemporary office practices.
6 hours of studio per week
[Course fee: $20]

ARE 1210 Construction Materials & Methods (5) **spring**
This course is a comprehensive study of common construction materials and methods of fabrication and erection employed in building construction. Sources, methods of manufacture, and uses of materials are covered. There are two different studio sessions within this course: the materials lab sessions familiarize the student with physical characteristics and uses of materials, performance of standard tests, and preparation of technical reports, while the design/drafting studio involves the detailing of construction assemblies. Accurate hand sketches and CAD are both used in the latter.
3 hours of lecture, 3 hours of lab, 3 hours of studio per week Prerequisite: ARE 1011
[Course fee: $40]

ARE 1220 Architectural History (3) **fall/spring**
Through photo slide lectures and seminars, the student is introduced to architectural design philosophies and construction systems that have developed over the ages. Influences such as social, political, religious, economic, and technological advances are traced from the first significant works of humans 5,000 years ago through the present day. A major concentration is western development since the 18th century, particularly in North America, and its significance to today's society is emphasized. Discussion seminars provide an opportunity for the student to join in follow-up discussions of lectures, with the objective of developing visual perception and knowledge of architectural styles and principles through the history of architecture.
3 hours of lecture per week

ARE 1221 Architectural History with Studies Abroad (4) **fall**
This course is based on ARE 1220, but includes a foreign study abroad component. The student enrolled in ARE 1221 studies and emphasize topics that relate to the current year's tour provider destination. Each year, the destination cycles through trips to Barcelona, London, Rome, and Greece.
3 hours of lecture per week, 1 week of foreign travel

ARE 2022 Architectural CAD II (3) **fall/spring**
This course covers advanced instruction in computer-aided drafting and design for architecture and building engineering. There are combined lecture and studio sessions in the use of "Building Information Modelling" in Revit Architecture to develop student skills in the industry standard for 3D design. Building design as well as presentation drawings and renderings are explored.
6 hours of studio per week Prerequisite: ARE 1011, 2051

ARE 2031 Environmental Systems I (3) **fall**
This course covers the natural environmental influences upon building design and construction as well as the principal internal necessities for human habitation including sanitation, heating/ventilating, and mechanical requirements in small buildings. The studio session reinforces the lectures by teaching the student how to design plumbing and heating systems for a small residential scale building.
2 hours of lecture, 3 hours of studio per week Corequisite: PHY 1042
[Course fee: $10]

ARE 2032 Environmental Systems II (3) **spring**
This is a continuation of ARE 2031. Broad-scale aspects of mechanical, electrical, and sanitary systems are investigated and studied as applied to larger buildings and groups of buildings. Other topics covered include electrical and lighting design; the impact that building codes and other regulations have on buildings; and current environmental topics affecting society today.
2 hours of lecture, 3 hours of studio per week Prerequisite: ARE 2031 or CPM 1010; MAT 1312
[Course fee $10]

ARE 2040 Construction Practices (3) **fall**
This course is a combination of several distinct areas in the building construction industry. One part of the course is comprised of an introduction to fundamental surveying principles and methods, including distance measurement, angular measurement, and elevation differences. Instrument practice and care for levels, electronic distance measurement instruments, and total station equipment are introduced. Other topics studied are: terminology, computations, developing site plans, and construction layout. Another part of the course covers topics in construction estimates and records including estimating, takeoffs, and pricing for both residential and commercial construction. A third part of the course covers construction management principles including scheduling practices, contracts, general conditions, and specifications.
2 hours of lecture, 3 hours of studio per week Prerequisite: ARE 1210

ARE 2051 Architectural Design I (3) **fall**
Individual design projects are developed by the student from conception to presentation under faculty supervision. Problem-solving and the process of design are taught and reinforced throughout the semester. Graphic techniques for design drawings are a major emphasis in this course. Building types covered range from small artifacts, through the house, to a small public building. Throughout the course, graphic and oral communication of goals, methods, and solutions are emphasized. Some projects are presented by the student before a jury of architecture faculty and practicing architects.
6 hours of studio per week Prerequisite: ARE 1011,1220
[Course fee: $20] Corequisite: ARE 2031

ARE 2052 Architectural Design II (3) **spring**
This course is a continuation of ARE 2051. The design projects and problem-solving involve more complex buildings than the previous course. The final project is a real-world building in Vermont. The student learns to work with zoning, building codes, and users of the building. Through the course, oral and graphic communication and presentation skill are developed as appropriate. The student works in a team on these projects to simulate real world working dynamics. The course terminates with the presentation of projects before a jury of architecture faculty and architectural practitioners.
6 hours of studio per week Prerequisite: ARE 2051
[Course fee: $20]

ARE 2720 Architectural & Building Engineering Seminar (1) **spring**
This lecture/seminar course for the sophomore student concentrates on developing knowledge and skills used in the workplace and throughout the student's life. Topics include job skills, continuing education, office practices, and soft skills.
1 hour of lecture per week Prerequisite: Sophomore standing

ARE 3010 Design Systems Integration (3) **fall**
The intent of this course is to concentrate the student's design thinking toward the areas used in architectural engineering, particularly in the integration of environmental and structural systems into the building design. The course complements the architectural engineering technology curriculum by introducing the student to the design of sustainable low-energy systems in small buildings and by providing tools for analysis in the schematic phase.
6 hours of studio per week Prerequisite: ARE 2032, 2051; CET 2120 or CPM 2030 or by AE.CET-BS.AET transfer policy
[Course fee: $20]

ARE 3020 Structural Analysis (3) **fall**

This course covers the analysis of statically determinate and indeterminate structures, building on the foundation that the student obtains in a course on statics. Topics include static determinacy and stability, reactions, and member forces and moments in beams, frames, and trusses through both determinate and indeterminate methods, as well as approximate methods. Deflection analysis is also covered. Computer applications for analysis are used. Topics such as matrix methods of analysis or dynamics/structural analysis may be introduced.

3 hours of lecture per week — Prerequisite: CET 2040; MAT 1520

ARE 3030 Steel Structures Design (3) **spring**

This course covers the design of steel structures, including typical structural elements such as tension members, beams, columns, base plates, connections, open web joists, and deck systems. Designs are based on the AISC Steel Construction Manual using the load and resistance factor design methodology. Issues such as economics of construction and sustainability are also addressed.

3 hours of lecture per week — Prerequisite: ARE 3020, 3111

ARE 3040 Electrical/Lighting Systems (3) **spring**

This course familiarizes the student with the various electrical and lighting systems commonly found in modern buildings. Systems include lighting, power, communications, and emergency systems. The course emphasizes design practices, safety/code issues, and coordination with other design professionals and building trades.

3 hours of lecture per week — Prerequisite: ARE 2032, 3112; ELT 2071

ARE 3050 Fundamentals of Fluids & Thermodynamics (4) **fall**

In this course, the student studies the basic concepts and practical applications of fluid mechanics and thermodynamics. Topics include fluid properties and measurement; energy conservation; pipe and duct flow; pumps and fans; the first and second laws of thermodynamics; refrigeration; psychometrics; basic thermodynamic processes; and HVAC.

3 hours of lecture, 3 hours of lab per week — Prerequisite: MAT 1520; PHY 1042

ARE 3111 Codes & Loads: Structural (1) **fall**

This course provides the student with an understanding of which codes and specifications govern the determination of design structural loads for buildings and other structures. It introduces the student to the determination and application of applicable code provisions and also to methods for calculating and estimating loads that are not specifically addressed (or are insufficiently addressed) in code books, manuals, and elsewhere (e.g., special studies, rules of thumb, past experience, expert elicitation). The course provides the basic knowledge and skills for the determination and use of such loads in courses such as steel structures design, concrete structures design, and senior project. Lectures introduce topics and methods of application; laboratories emphasize the application of codes and methods on varying structure types. This is a half-semester course usually conducted the first half of the semester.

1 hour of lecture, 3 hours of lab per week — Prerequisite: CET 2120

ARE 3112 Codes & Loads: Mechanical/Electrical (1) **fall**

This course provides the student with an understanding of which codes and specifications govern the determination of design heating/cooling and lighting/electrical loads for buildings and other structures. It introduces the student to the determination and application of applicable code provisions and also to methods for calculating and estimating loads that are not specifically addressed (or are insufficiently addressed) in code books, manuals, and elsewhere (e.g., special studies, rules of thumb, past experience, expert elicitation). The course provides the basic knowledge and skills for the determination and use of such loads in courses such as HVAC, plumbing, electrical/lighting, and senior project. Lectures introduce topics and methods of application; studios emphasize the application of codes and methods on varying structure types. This is a half-semester course usually conducted the second half of the semester.

1 hour of lecture, 3 hours of studio per week — Prerequisite: ARE 2032; MAT 1520; or instructor permission

ARE 4010 Concrete Structures Design (3) **fall**

This course covers the design of typical statically determinate and indeterminate concrete structures. The course makes extensive use of the American Concrete Institute building code requirements and considers concrete and steel material properties, design approximations, design of concrete linear members (beams and columns), slabs, foundations, and walls. Sustainable engineering concepts are addressed.

3 hours of lecture per week — Prerequisite: ARE 3020, 3111; CET 2120

ARE 4020 Architectural Engineering Management (3) **fall**

This course covers many of the business, management, professional, and ethical subjects that architectural engineers and other infrastructure professionals may face during their careers. These may include legal issues; business organizational frameworks; personnel and diversity issues; business planning and decision making; marketing; scheduling; professional ethics; project and design cost issues (including engineering economics); information management; technical presentation skills; and others. The course helps the student develop communication skills and the ability to analyze and create management-related documents and situations using various methods.

3 hours of lecture per week

ARE 4030 HVAC Systems (4) **spring**
This course addresses the engineering aspects of heating, ventilating, and air conditioning systems design. There is a focus on mechanical systems for commercial buildings that includes psychometrics; basic HVAC calculations; design condition determination; load estimating; duct and pipe sizing; HVAC systems; and HVAC equipment selection. The student is required to perform system design on a commercial building in preparation for ARE 4720. Introductions to energy conservation, comfort condition, indoor air quality, and mechanical codes are included. ASHRAE standards and international codes are used as a basis in these areas.
3 hours of lecture, 3 hours of studio per week Prerequisite: ARE 2032, 3050, 3112
[Course fee: $15]

ARE 4040 Plumbing Systems (3) **spring**
A student in this course learns the basic practices and techniques for the design of plumbing systems in buildings. International Plumbing Code Commentary is the basis of course materials. Emphasis is placed on the design and calculations for sizing sanitary waste and vent systems; domestic hot and cold water systems; water heaters; storm drainage systems; and fire sprinkler systems, as well as fixture selection. Each topic includes discussions on materials and methods of construction and installation, code requirements, computer applications, specifications, and drafting symbols and standards.
2 hours of lecture, 3 hours of studio per week Prerequisite: ARE 2032, 3050

ARE 4050 FE Exam Survey (1) **fall**
This course provides the student with applications for and review of engineering, math, and science concepts to prepare for the Fundamentals of Engineering (FE) examination (primarily the “other disciplines” subject area) administered by most states as a first step toward professional licensure as a Professional Engineer. The course focuses on topics that the student has been exposed to previously and on new topics that are generally easier to understand and apply with limited explanation of background material. FE exam topics that are covered significantly in senior-level ARE courses (e.g., ethics and engineering economics) receive limited coverage. Strategies for studying for and taking the FE exam and similar examinations are covered, as is the application of engineering judgment in general.
3 hours of studio per week Prerequisite: Senior standing in AET or an ABET-accredited program or instructor permission

ARE 4720 ARE Senior Project (4) **spring**
This course is a capstone course that integrates knowledge and skills developed through other coursework and life experience. The student typically prepares drawings; design or evaluation documentation; and presentations for a commercial-scale project based on preliminary and incomplete architectural plans (the ASHRAE national student competition building is often used), an existing built structure, or other information. The student works on electrical/lighting, mechanical, or structural systems. In most cases, a semester-long final design in one subject area is undertaken.
2 hours of lecture, 6 hours of studio per week Prerequisite: ARE 2022, 3030, 3040, 4010, 4020, 4030
[Course fee: $10]

Atmospheric Sciences (ATM)

ATM 1031 Aviation Meteorology I (3) **fall**
Meteorology is the scientific study of the atmosphere and weather events that interact with temperature, air pressure, water vapor, and time change across local, regional, and intercontinental geographies. This course provides the student with a foundation for understanding and applying weather factors to the safe operation of aircraft in preparation for the FAA knowledge exam for safe operation and for earning a Private Pilot certificate.
3 hours of lecture per week

ATM 1032 Aviation Meteorology II (4) **spring**
This course explores a deep understanding of applicable weather conditions and how they impact aircraft operations. This essential process allows accurate analysis for both preflight and in-flight application. The process leads to certification for flying as an Instrument rated aviator. This builds on the basics of ATM 1031 as it applies to the dynamics of flight conditions such as turbulence, icing, thunderstorms, and low visibility related to instrument flight operations. During subsequent aviation courses, the student is routinely challenged to integrate and analyze all appropriate aviation meteorological conditions. The student provides feedback on the effectiveness of interpretations by using current and future web-based weather products.
3 hours of lecture, 2 hours of lab per week Prerequisite: AER 1020; ATM 1031
Corequisite: AER 1110, 1120

Automotive Technology (ATT)

ATT 1011 Suspension & Steering I (1.5) **fall**
This course gives the student a thorough understanding of the theory, construction, and design of vehicle steering and suspension systems. Emphasis is placed on the geometry of links and levers; vehicle suspension requirements; vehicle handling and dynamics; and the diagnosis of suspension problems.
2 hours of lecture, 3 hours of lab per week for the first half of the term
[Course fee: $55]

ATT 1012 Suspension & Steering II (1.5) **fall**
This course is a continuation of ATT 1011.
2 hours of lecture, 3 hours of lab per week for the second half of the term Prerequisite: ATT 1011

ATT 1020 Engine Diagnostics & Repair (4) **fall**
This course provides a comprehensive study of the theory, construction, design, and repair of the internal combustion engine. Topics discussed include engine classification; power and torque development; engine power-efficiency tests; engine performance parameters; and mechanical design and failure analysis. The lab reinforces the lecture by providing engine performance diagnostic procedures, mechanical repair, and overhaul procedures. System problem diagnosis and component failure analysis are continually stressed.
3 hours of lecture, 3 hours of lab per week

ATT 1051 Alignment & Brakes I (2) **spring**
This course gives the student a thorough understanding of the theory, construction, and design of those mechanical devices utilized in tires; wheels and bearings; and hydraulic braking systems. Emphasis is placed on the geometry of links and levers; the physics of friction and hydraulics; vehicle braking requirements; vehicle handling and dynamics; wheel alignment procedures and equipment; and the diagnosis of brake problems. This course also includes curriculum necessary for successful completion of the Vermont state inspection certification test, administered by the DMV. The student who is already certified receives credit for the inspection portion of the course.
3 hours of lecture, 3 hours of lab per week for the first half of the term Prerequisite: ATT 1012
[Course fee:$100]

ATT 1052 Alignment & Brakes II (2) **spring**
This course is a continuation of ATT 1051.
3 hours of lecture, 3 hours of lab per week for the second half of the term Prerequisite: ATT 1012, 1051

ATT 1090 Automotive Electronics Lab (1) **fall**
This is the automotive lab section for GTS 1120. The lab uses electrical test equipment to analyze and troubleshoot basic electrical circuits including warning systems, electrical accessories, and battery starting and charging systems.
3 hours of lab per week Corequisite: GTS 1120

ATT 1110 Automotive Electrical Systems Lab (1) **spring**
This course is the automotive lab section for GTS 1040 and is intended to give the student a thorough understanding of electrical systems and to teach diagnostic and troubleshooting skills. Topics include the operation and testing of storage batteries, starting systems, charging systems, ignition systems, and basic accessory systems. The student becomes familiar with various types of test equipment, diagnostic charts, and vehicle wiring schematics.
3 hours of lab per week Corequisite: GTS 1040

ATT 2010 Engine Performance (4) **fall**
This course gives the student an understanding of fuel delivery systems as they related to the internal combustion engine. Topics include engine air/fuel requirements, gasoline fuel injection systems, diesel fuel injection systems, and vehicle emissions and emission controls. The analysis of fuel-related problems, diagnosis of component failures, and verification of repairs are also included.
3 hours of lecture, 3 hours of lab per week Prerequisite: GTS 1040; PHY 1030
[Course fee: $125]

ATT 2020 Body Electronic Systems (4) **fall**
This course gives the student an understanding of commonly used body systems. Major topics studied include heating, ventilation, and air conditioning; instrument panels; airbags; and antilock brakes. The student is familiarized with system operation, diagnostic techniques, system failure analysis, and repair. The lab offers experience in diagnosis and repair of these systems as well as more practice in using electrical diagnostic techniques.
3 hours of lecture, 3 hours of lab per week Prerequisite: ATT 1012; GTS 1040; PHY 1030
[Course fee: $100]

ATT 2030 Advanced Engine Performance & Fuel (4) **spring**
This course is intended to give the student a thorough understanding of the electronic controls and devices used on the modern automobile power train. Topics covered include the theory, design, operation and application of various domestic and foreign electronic control systems. Analysis of system problems; diagnosis of system failures; component and system test procedures; sensors; emissions systems; advanced drivability diagnostics; exhaust gas analysis; and causes of premature component failure are studied in detail.
3 hours of lecture, 3 hours of lab per week Prerequisite: ATT 2010
[Course fee: $75]

ATT 2040 Automotive Drive Trains (4) **spring**
In this course, the student learns the principles of construction, design, and operation of mechanical devices used in the modern automotive drive train. Specific topics include helical and planetary gear drive systems; torque converters; hydraulic control systems; principles of electronically controlled transmissions; clutches; manual transmission and transaxles; drive shafts and axles; universal and CV joints; differentials; transfer cases; and

problem diagnosis and component failure analysis.
3 hours of lecture, 3 hours of lab per week Prerequisite: ATT 1012
[Course fee: $175]

ATT 2060 Advanced Technology Vehicle (4) **spring**
This course introduces the student to the design operation, and servicing of electric, hybrid, alternative fuel, and fuel cell vehicles. Topics include basic physics and chemistry influenced design; motor and generator design and utilization; hybrid electric vehicle design variations; maintenance and service; light-duty diesel; CNG vehicles; and a basic introduction to fuel cell vehicles.
3 hours of lecture, 3 hours of lab per week Prerequisite: ATT 1012
[Course fee: $50]

ATT 2801 ATT Summer Internship (0) **summer**
This course is a ten-week, 400-hour summer cooperative education experience followed by a one-credit fall internship review. Pass/No Pass.
400 hours of lab per term Prerequisite: Department permission

ATT 2802 ATT Summer Internship Review (1) **fall**
This course is a one-credit fall internship review. Pass/No Pass.
[Course fee: $250] Prerequisite: ATT 2801

Biological Sciences (BIO)

BIO 1020 Introduction to Environmental Biology **(4)** **fall**
This course is intended to introduce the student to the fundamentals of environmental biology. It introduces the structure and biota of several aquatic and terrestrial ecosystems and the student investigates why species occupy specific habitats. The course includes an introduction to Vermont's aquatic and terrestrial ecosystems; spatial and temporal changes in ecosystems and species; and critical observation and interpretation of landscapes. The course stresses communication skills, as well as critical thinking and teamwork.
3 hours of lecture, 2 hours of lab per week

BIO 1030 Nutrition **(3)** **fall**
This course introduces the student to the physiological basis of nutrition and evaluates dietary requirements. Emphasis is placed on metabolism, digestion, and nutrients used in the human body and the nutrition involved in health, disease, and aging.
3 hours of lecture per week

BIO 1040 Principles in Biology (4) **fall**
This course provides a general knowledge of biology from the molecular level to whole systems. Topics include cell chemistry, evolution, genetics, ecology, diversity, and population dynamics. When applicable, the class focuses on biological aspects of the state of Vermont.
3 hours of lecture, 3 hours of lab per week

BIO 1220 Botany **(4)** **spring**
This course provides the student with an understanding of the fundamentals of plant growth and development. Higher plant structure, metabolism, growth regulators, and mineral nutrition are emphasized. The student also becomes acquainted with the diversity of plants and plant-like organisms through the study of bacteria, viruses, algae, fungi, mosses, and lower vascular plants.
3 hours of lecture, 3 hours of lab per week

BIO 1241 Introduction to Forest Ecology (4) **fall**
Through this course, the student gains an understanding of the functions of a forest ecosystem and learns tree identification, silviculture practices, and the significance of natural communities such as vernal pools and wetlands. A central component of this course is a lab in which the student studies the natural communities that comprise the VTC forest.
3 hours of lecture, 3 hours of lab per week

BIO 2011 Human Anatomy & Physiology I **(4)** **as required**
This is the first semester of a two-semester course which examines the structure and functions of the human body. Topics include fundamental principles of cell and tissue structure; gross anatomical and physiological organization; electrochemical communication systems; and muscle physiology. This is a laboratory course that involves hands-on or simulated laboratory experiences. Prior successful completion of basic algebra and chemistry or biology courses is recommended.
3 hours of lecture, 3 hours of lab per week

BIO 2012 Human Anatomy & Physiology II **(4)** **as required**
This is the second semester of a two-semester course that examines the structure and functions of the human body emphasizing and building upon the concepts learned in BIO 2011. Topics include special senses, endocrine system, blood, cardiovascular system, respiratory system, digestive system, urinary system, and reproductive system.
3 hours of lecture, 3 hours of lab per week Prerequisite: BIO 2011

BIO 2030 Plant Pathology (3) **spring**
In this course, the student explores the organisms and environmental factors that cause plant diseases. The biology of fungi, bacteria, and viruses, including their life histories, is studied extensively. A systematic approach to discovery and identification of plant disease is examined and the student learns to recognize disease symptoms. Methods of disease management are covered with emphasis placed on bio-rational techniques.
2 hours of lecture, 3 hours of lab per week Prerequisite: BIO 2040 or instructor permission

BIO 2040 Entomology & Ecological Pest Management (3) **spring**
Entomology examines the biology and management of insect and other related invertebrate pests that attack ornamental plants. In this course, the student studies insect morphology, anatomy, life processes, and ecology with special emphasis placed on insect identification and life histories. The student explores management strategies as part of an integrated approach to pest management.
2 hours of lecture, 3 hours of lab per week

BIO 2120 Elements of Microbiology **(4)** **as required**
This course offers the student an opportunity to examine organisms that are too small to be seen with the naked eye, a comprehensive study of the basic principles of microbiology. A brief survey of the history of the science is given. Emphasis is placed on understanding the variety and differences of microbes and their relationship to humans. Prior successful completion of BIO 2012 is recommended.
3 hours of lecture, 3 hours of lab per week

BIO 2320 Zoology **(4)** **fall**
This course acquaints the student with the fundamental concepts of animal biology, including molecular genetics and inheritance, evolution, and biological systems with an emphasis on vertebrates. Previous successful completion of courses in biology and chemistry is recommended.
3 hours of lecture, 3 hours of lab per week

Business (BUS)

BUS 1010 Introduction to Business **(3)** **fall**
The focus of the course is to survey the interconnected disciplines of economics, management, marketing, finance, operations, and information technology. The course also facilitates college success strategies such as note-taking, time management, test-taking, and study skills. The student is introduced to assignments typical of higher-level business courses with the goal of developing effective oral and written communication, critical thinking, problem-solving, interpersonal skills, and personal and professional ethical behavior.
3 hours of lecture per week

BUS 2020 Principles of Management **(3)** **fall**
This course introduces the philosophy, principles, and techniques of management. The student examines classical, modern, and emerging concepts as they relate to today's manager and the functional processes of planning, organizing, directing, and controlling resources. Learning experiences may include case studies, team experiences, and simulations.
3 hours of lecture per week

BUS 2041 Foundations of Entrepreneurship (3) **fall**
This course provides the foundations for understanding the nature, challenges, and rewards of entrepreneurship. Entrepreneurship is approached as a special and unique way of thinking and behaving. The student gains an understanding that entrepreneurship is a predictable and manageable process applicable to profit, non-profit, and public organizations.
3 hours of lecture per week

BUS 2131 Writing for Electronic & Social Media (3) **as required**
This course examines the history of electronic communication and social media and their roles in society and business. The course integrates components of communication, sociology, marketing, and analytics. The student reflects on the impact of social media on individuals and on the consumer experience and they discuss the ethical, cultural, global, and professional effects. The course focuses on how individuals and organizations can maximize the potential and minimize the drawbacks. The student writes emails, instant messages, and text messages and creates blogs, microblogs, and social media postings. The course prepares the student to analyze the impact of electronic communication, to write typical business messages, to have a role in marketing, or to pursue an entrepreneurial venture. The class also reviews grammar guidelines and research techniques.
3 hours of lecture per week

BUS 2132 Management Applications (3) **spring**
This course focuses on leadership theories and techniques with emphasis on the action skills managers need for success. Topics include leadership styles and strategies; the timeline of management theories, from classical to modern; and effective meeting management. The student learns the basics of parliamentary procedure; conducts and participates in a business meeting according to Robert's Rules of Order; and participates in team activities, role plays, and an oral presentation.
3 hours of lecture per week

BUS 2140 **Personal Finance (3)** **as required**
The heart of personal financial planning is making sure that your values line up with how you spend and save. The goal of this course is to remove the mystery from the personal financial planning process and replace it with the tools needed to take charge of personal finances and life. Personal financial planning provides major benefits that help marshal and control financial resources more effectively and facilitate an improved standard of living. Because the emphasis in this course is on planning, it examines various areas to set and implement plans aimed at achieving financial goals. These areas include using financial statements and budgets; managing basic assets, credit, insurance needs, and investments; and planning for retirement.
3 hours of lecture per week

BUS 2210 Small Business Management **(3)** **fall/spring**
This course explores the practical aspects of organizing and managing a small business. The goal of the course is to equip the student with the knowledge necessary to make informed business decisions. The student examines how to analyze a business and improve its management. The course covers the basic concepts of accounting, finance, cash management, business law, government regulations, taxes, and marketing.
3 hours of lecture per week

BUS 2230 Principles of Marketing **(3)** **spring**
This course examines the role of marketing as it relates to manufacturing, wholesale, retail, and service businesses. Emphasis is placed on the marketing mix of product, place, promotion, and price. The student learns marketing strategies well-suited to small business.
3 hours of lecture per week

BUS 2270 Organizational Communication (3) **as required**
This class offers a hands-on approach to learning the roles, processes, and skills of interpersonal, group, and public communication in personal and professional settings. The objective of the course is to understand the role of people in the communication process, both individually and in groups. The student learns the psychology of face-to-face communication, the role of non-verbal communication, teamwork, effective listening, and professional behavior and then plans, prepares, and presents team oral presentations.
3 hours of lecture per week
[Course fee: $65]

BUS 2410 Human Resource Management **(3)** **spring**
This course examines the critical issues and the strategic questions that must be considered when managing diverse groups of people in today's workplace. Topics include selecting, training, and evaluating personnel; compensation; health and safety; bargaining units; motivation; morale; and human relations.
3 hours of lecture per week

BUS 2440 Introduction to Business Law (3) **fall/spring**
This course familiarizes the student with the law as it relates to business. Following a review of the legal and constitutional environment of business, the course focuses on contract law; the Uniform Commercial Code; negotiable instruments; debtor and creditor rights; bankruptcy; and agency relationships.
3 hours of lecture per week

BUS 2820 Business Internship & Career Seminar (3) **as required**
This course blends the reflective nature of classroom learning with the applied nature of the workplace and focuses on the role and importance of work in society, the impact of work, and work-life balance in one's personal and professional life. Readings and online forum discussions examine topics such as matching skills and interests to career paths; job search and interview techniques; physical, emotional, and financial well-being; work/life balance; dealing with difficult people; organizational politics; and ethical implications of decisions and actions. The student creates a resume, cover letter, and LinkedIn profile and learns effective job search and interview techniques.
3 hours of online lecture per week

BUS 3041 Applied Entrepreneurship (3) **fall**
This course takes the fundamentals of entrepreneurship and applies them to business cases and fieldwork. The course is divided into two sections: creating and pitching a new business concept and evaluating an existing entrepreneurial venture through fieldwork. The student works in a team to create, evaluate, and develop a concept for a new entrepreneurial venture for either a profit or non-profit mission. The student also engages in field work with an existing organization engaged in entrepreneurial activities. Organizations may be identified by the student or through client-based service providers (VT SBDC, VMEC, United Way, VBSR, etc.)
3 hours of lecture per week

BUS 3150 Production & Operations Management **(3)** **fall**
This survey course develops the administrative skills and knowledge needed to effectively and efficiently manage the elements of production and service operations. The student is exposed to quantitative models commonly seen in management science which are used to optimize the efficient use of resources including materials, facilities, and manpower.
3 hours of lecture per week Prerequisite: MAT 2021

***BUS 3230 Principles of Financial Management* (3)** **fall**
This course teaches the student to use accounting data to make financial decisions. The student learns decision-making techniques and uses them to address financial situations faced by a firm.
3 hours of lecture per week Prerequisite: ACC 1020 or 2121

***BUS 3250 Organizational Behavior & Management* (3)** **spring**
This course focuses on the structure and function of human behavior in organizations. The course explores the behavioral influences impacting productivity, organizational effectiveness, and efficiency. Behavior is examined at the individual, small group, and organizational levels. Topics include perception, motivation, negotiation, decision-making, communication, job design, power, politics, and organizational culture.
3 hours of lecture per week Prerequisite: BUS 2020

***BUS 3260 Investments & Portfolio Management* (3)** **as required**
This course examines investments in stocks, bonds, government securities, options, and collectibles. Topics include investment setting; securities valuation and analysis; security markets and regulations; and portfolio constraints.
3 hours of lecture per week Prerequisite: BUS 3230

BUS 3410 Business Ethics (3) **fall**
This course introduces the student to the general field of ethics and gives them the tools to apply ethical thinking to the business environment. An overview of modern ethical thought is provided with specific cases and scenarios presented which the student assesses from legal, moral, and economic perspectives.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

BUS 3721 Business Planning Seminar (3) **spring**
This course teaches the student how to estimate the market potential for a business idea and provides a realistic experience in the process of preparing a business plan that attracts lenders or investors. The student should already have a business idea or a technology to develop. The course emphasizes the importance of market research and the collection of the information necessary to establish the viability and sustainability of a business idea. There is a heavy emphasis on knowing the target market; analyzing competition; and anticipating how the external environment affects a business. During the semester, the student will repeatedly defend their ideas with peers and invited guests. The development and presentation of a sound business plan is the final product.
3 hours of lecture per week Prerequisite: BUS 2210, 3230

BUS 3811 Business Problem Practicum (3) **spring**
This course serves as both a practice and a capstone experience in team research and presentation skills. The course integrates skills and knowledge developed through previous coursework. The student works in a team to select a business topic for research and oral presentation. Where appropriate and with instructor's approval, the student may select a client-based problem. Teams present a significant business problem, offer proof of the problem, recommend solutions, and give evidence that the solutions will help solve the problem. A final team oral presentation is required.
3 hours of lecture per week

***BUS 4080 Business Policy & Strategy Development* (3)** **as required**
This capstone course focuses on both the analysis of an organization's internal and external environments and on the development of appropriate corporate, business, and function level strategies. The case study method is used extensively with emphasis placed on policy formulation, strategic implementation, and control. Both for-profit and not-for-profit organizations are included.
3 hours of lecture per week

BUS 4310 Business Information Architecture (3) **as required**
In this course, the student learns and applies theory, process, design, and development to create effective, user-centered written and electronic communications. The course focuses on the convergence of communication technology and tools and the impact on business applications such as letters, email messages, instant messages, podcasts, and a variety of social media. The student designs and creates an online portfolio to showcase education, skills, abilities, and experience for a job search.
3 hours of lecture per week

BUS 4510 Business Management Through Information Technology (3) **as required**
In this course, the student examines the role of information technology in the conduct of business and the managerial uses of information at the operational, tactical, and strategic levels of decision-making. Topics focus on the use of IT to facilitate business change in policy and practice. The course includes discussion of the importance of communications to today's business organization and the role of the non-IT professional in systems development.
3 hours of lecture per week Prerequisite: BUS 2020

***BUS 4530 Technical Project Management* (3)** **spring**
This course introduces the student to the field of project management. Because of the wide nature of the topic and the limited time of the course, coverage is broad and emphasizes and follows the Project Management Institute (PMI) model of project management.
3 hours of lecture per week

Continuing Education (CED)

CED 0011 Emergency Medical Services (0) **fall**
This course follows the guidelines of the National Medical Service Blueprint for Education with approval and oversight by the Vermont Department of Health. This course focuses on the assessment and management of medical emergencies and trauma in the prehospital environment. It provides a foundation for understanding anatomy, physiology, pathophysiology, and emergency medical service operations through a series of lecture, small group activities, and skill labs. The course prepares the student to test for licensure with the National Registry of Emergency Medical Technicians (NREMT) through the Vermont Department of Health. The exam is computer-based. If the student is licensed under a Vermont EMS organization, the exam is $70. Each subsequent exam is $70. Pass/No Pass.
[Course fee: $450]

CED 0012 Firefighting Services I (0) **fall**
This introductory course provides an overview of fire services; career opportunities in firefighting and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private firefighting services; fire departments as part of local government; laws and regulations affecting the fire service; introduction to fire protection systems; and understanding fire strategy and tactics. The student learns basic fire suppression, rescue, and extrication skills. This academic course includes competency-based skill development necessary to perform fire/rescue duties and is part one of a two-part course leading to Vermont certification as a Firefighter I & II. This certification is through the Vermont Fire Academy and is subject to their schedule.
5 hours of lecture, 2 hours of lab per week

CED 0013 Firefighting Services II (0) **spring**
This course continues the study of fire service nomenclature; specific firefighting techniques and functions; basic fire chemistry and physics; fire protection systems; and understanding fire strategy and tactics. The student learns and practices basic fire suppression, rescue, and extrication skills. Upon successful completion of this course, the student is eligible to apply for Vermont certification as a Firefighter I & II. This procedure includes passing a written exam, proficiency skill-based testing, and participation in a live burn exercise at a Vermont Fire Academy training site. This certification is through the Vermont Fire Academy and is subject to their schedule.
3 hours of lecture per week — Prerequisite: CED 0012/FSC 1021; VFA Pro-Board certification

Civil & Environmental Engineering Technology (CET)

CET 1000 Freshman Orientation (1) **fall**
This course focuses on introducing the skills required by the student for success in the Civil & Environmental Technology program. The course may have guest speakers and field trips to construction projects and public facilities that give the student a picture of the variety of work done by civil and environmental engineers and the job opportunities in the field.
2 hours of seminar per week for the first half of the semester

CET 1011 Surveying I (3) **fall**
This course introduces fundamental surveying principles and methods including benchmark leveling; the measuring of distances and angles; and instruction and practice in the care and use of equipment. Areas covered are azimuths and bearings; coordinate geometry; cross-sections and profiles; note-keeping; computations and field practice related to traverses; introduction to total stations and point files; and the adjustment of surveying instruments. The basics of construction surveying are discussed.
2 hours of lecture, 3 hours of lab per week — Corequisite: MAT 1311

CET 1020 Engineering Materials (3) **spring**
Lab problems are designed to parallel classroom studies and to develop proficiency in the analytical solution of mechanics problems. Some physical testing and related analysis are also conducted, which may include one or more of the following: metal tension tests, bolted connections, beams, and columns. As a result of completing the labs, the student performs the numerical analyses related to course outcomes and course content, performs laboratory testing related to selected topics in the course content, and analyzes experimental data and relates it to course content.
2 hours of lecture, 3 hours of lab per week
[Course fee: $30]

CET 1030 CAD for Civil Engineering (2) **as required**
This course provides a solid foundation in CAD for the Civil & Environmental Engineering program. The course covers topics in CAD and Carlson software. The student should have the ability to move files using Windows Explorer and be familiar with Microsoft Word.
6 hours of lab per week — Prerequisite: Basic computer skills

CET 1031 Engineering & Surveying Computer Applications I (2) **fall**
This course provides the student with a working knowledge of the use of computers for Civil & Environmental Engineering Technology. No prior computer training is required. The course introduces the computer and its operating system in conjunction with laboratory assignments in the use of CAD. The fundamentals of CAD operation and application are presented through the use of civil and environmental engineering topics includ-

ing site, structural, and environmental drawings. Major graphic subjects include creating and editing CAD primate and complex entities, dimensioning, drawing construction, layout, and output. Spreadsheets are also introduced with applications appropriate to the field, including calculations, quantities, estimates, and graphs.
6 hours of lab per week
[Course fee: $35]

CET 1032 Engineering & Surveying Computer Applications II (2) spring
This course is a continuation of CET 1031 intended to provide proficiency in the creation and understanding of working drawings related to civil engineering. Covered CAD topics include advanced CAD entity manipulation, customization, and programming. The student is introduced to a civil survey software package used for site mapping, terrain modeling, and road and utility design. In addition, related technologies such as Geographic Information Systems (GIS), their applications, and data sources, are discussed.
6 hours of lab per week — Prerequisite: CET 1031

CET 2012 Surveying II (4) fall
A continuation of CET 1011, this course gives additional and more detailed information in route location and design, construction surveying, and advanced surveying topics. Specialized equipment such as electronic distance measuring instruments and state-of-the-art total stations and data collectors are used in the field labs. Lease squares adjustments are introduced. Cogo surveying software is an integral portion of the course.
2 hours of lecture, 2 hours of lab per week — Prerequisite: CET 1011,1032
[Course fee: $40] — Corequisite: MAT 1520

CET 2020 Hydraulics & Drainage (3) fall
This course includes an introduction to the fundamental concepts of fluids and to the application of flow mechanics in civil and environmental engineering projects. Topics include open channel flow, precipitation, stormwater run-off, infiltration, groundwater, watershed drainage systems, measuring devices, buoyancy, and steady flow. Calculations and laboratory work involve the use of precipitation data; culver and stormwater system design; flume and hydraulic bench experiments; and the use of current industry standard computer programs.
2 hours of lecture, 3 hours of lab per week — Prerequisite: PHY 1041
Corequisite: MAT 1520

CET 2030 Environmental Engineering & Science (3) spring
This course emphasizes quantitative analysis of environmental problems and introduces the student to engineering methods for treatment and prevention of water, soil, and air pollution. Fundamental concepts of chemistry, microbiology, ecology, and statistics, which are critical to environmental analysis and engineering design, are covered. The lab includes both field and indoor testing of water quality as well as field trips to environmental facilities.
2 hours of lecture, 3 hours of lab per week — Prerequisite: CHE 1031; MAT 1520; PHY 1041

CET 2040 Statics & Strength of Materials (4) fall
Statics involves the study of vector forces, resultants, and moments and their effect on beams, columns, frames, and trusses. Strength of materials includes the study of material properties; tension; compression; shear and bending stresses; and the methods of determining centroids and moment of inertia. Lab work includes calculation of force and stress analysis in addition to material testing.
3 hours of lecture, 3 hours of lab per week — Prerequisite: PHY 1041
Corequisite: MAT 1520

CET 2050 Civil & Environmental Design (4) spring
This course gives the student experience with realistic civil engineering technology problems that require the use of knowledge and skills obtained in previous courses taken at Vermont Tech. Under faculty supervision, the student designs a project that could include site development plans; buildings and parking structures; bridges; water supply and treatment facilities; and roads and highways. The student develops graphic presentations, preliminary designs, calculations, and working drawings. The final phase of some projects may include estimating and construction scheduling.
2 hours of lecture, 6 hours of lab per week — Prerequisite: CET 2012, 2020, 2030
Corequisite: CET 2110, 2120

CET 2110 Mechanics of Soils (3) spring
This course covers the basic principles and applications of soil mechanics as used in design and construction and introduces knowledge of soil and its formation, actions, and uses. Included are studies of index properties; soil classification; exploration and sampling; compaction; soil strength; erosion control; foundations; and retaining walls. Problems relating to these items are presented and solved. Laboratory testing is done in conjunction with classroom studies to give a more complete understanding of the material. Each student is required to prepare an individual technical report of each test performed.
2 hours of lecture, 3 hours lab per week — Prerequisite: CET 2040

CET 2120 Structural Design (3) spring
This course studies the design of structural systems, focusing on solid sawn wood and engineered wood

products. Structural loads, general framing concepts, structural drawings, and (primarily) wood structural systems are presented. The design of various wood structural configurations such as tension members, beams, columns, and connections is covered in accordance with relevant design codes. Structural foundations are introduced. Laboratory work consists primarily of the application of building and design codes to the design and analysis of structural systems.
2 hours of lecture, 3 hours lab per week — Prerequisite: CET 2040
[Course fee: $10]

CET 3010 Evidence & Procedures for Boundary Line Location (3) — **spring**
The purpose of this course is to familiarize the land surveying student with the importance of locating the original boundary line between two or more tracts of land, the evidence necessary to collect, and the procedures for this collection.
3 hours of lecture per week — Corequisite: CET 2012

Chemistry (CHE)

***CHE 1020 Introduction to Chemistry* (4)** — **as required**
This survey course examines atomic structure; the periodic table; chemical reactions; gases; liquids; solids; chemical equilibrium; acids and bases; bonding; molecular structure; and an introduction to organic chemistry.
3 hours of lecture, 2 hours of lab per week

***CHE 1031 General Chemistry I* (4)** — **as required**
This course is intended for the engineering student and consists of the fundamentals of general and physical chemistry. Lab experiments reinforce concepts introduced in lectures; teach basic laboratory skills and techniques; and introduce some methods of analysis currently used in industry. Fundamental quantitation and analytical techniques are emphasized.
3 hours of lecture, 3 hours of lab per week

CHE 2060 Principles of Organic Chemistry (4) — **spring**
This course enhances knowledge and skills in organic chemistry and includes a general overview of aliphatic compounds (hydrocarbons, alcohols, ethers, aldehydes, ketones, carboxylic acids, carbohydrates); cyclic compounds; and combinations of aliphatic and cyclic structures (including amino acids and nucleic acids). Important areas of organic chemistry are covered, including polymerization, hydrogenation, isomerization, photochemistry, and stereochemistry.
3 hours of lecture, 3 hours of lab per week — Prerequisite: CHE 1031

Computer Science (CIS)

CIS 1030 Introduction to Computers (3) — **as required**
In this course, the student becomes familiar with the Windows operating system, the applications that comprise the Microsoft Office software suite (word processing, spreadsheet, database, and presentation graphics), and communication software.
3 hours of lecture and lab per week

***CIS 1041 Computer Applications* (3)** — **fall**
This course is a hands-on introduction to information professing using the Windows operating system and application software designed for computers and mobile devices. The course covers file management, presentation graphics, word processing, and spreadsheets. Basic algebra skills are recommended.
1 hour of lecture, 4 hours of hybrid format lab per week

CIS 1042 Computer Applications II (3) — **spring**
In this course, the student learns advanced information processing skills using the Windows operating system and common applications for business including word processing, spreadsheets, database management, presentation graphics, publishing, and digital image manipulation.
1 hour of lecture, 4 hours of hybrid format lecture per week. — Prerequisite: CIS 1041

***CIS 1050 Introduction to Spreadsheets* (1)** — **fall/spring**
This course covers the concepts, knowledge, and skills necessary to design, create, organize, store, and utilize spreadsheets in varied settings. The student explores concepts and skills such as user-made functions, translation to graphs, using library macros, user macro development, and what-if scenarios. The successful student is prepared to generate and use spreadsheets to process information rapidly in virtually any setting and obtains the performance of a professional in the workplace. This course is conceptual in nature and includes direct application to hands-on real-world settings.
1 hour of lab per week

CIS 1080 Introduction to Spreadsheets & Database Management (2) — **fall/spring**
This course introduces the student to email, Web Services, and the internet, as well as spreadsheets and databases. Spreadsheet topics include all functions necessary to build a spreadsheet and create graphs. Database topics include the fundamentals of computer database design and management.
2 hours of lab per week

CIS 1120 Introduction to Information Science & Technology (3) **fall**
This course introduces the student to the world of IST across a broad range of topics including the history of computing, computing in society, career paths in computing, and the use of computers in the workplace.
3 hours of lecture per week

***CIS 1151 Website Development* (3)** **fall**
This course includes the introduction of web pages for commercial websites including use of and design with Hypertext Markup Language (HTML), text, and graphics; applying appropriate design, color, and art; size and placement of graphics, including image maps, in a webpage; creation of advanced tables, including nested tables; creation of forms that contain advanced input types and attributes, text areas, and advanced lists; and use of a validation tool to debug an HTML document.
2 hours of lecture, 2 hours of lab per week; online: 3 hours of lecture per week

CIS 1152 Advanced Website Development (3) **spring**
This course teaches the student how to implement, monitor, and deploy a complete website and integrate the website with a database. The emphasis is on the PHP language and server side processing. JavaScript is used when it is suited to the desired task. Topics include authentication methods; form processing; form validation using HTML 5, JavaScript, and PHP; an overview of databases; PHP functions to interface with a database; and website security.
3 hours of lecture per week Prerequisite: CIS 1151

CIS 2010 Computer Organization (4) **spring**
In this course, the student gains a basic understanding of computer hardware through introduction to binary data representation, pointers, and memory through the C programming language. This understanding expands to include the functioning of the CPU including registers, ALU, and simple I/O and culminates in an introduction to assembly language.
3 hours of lecture, 2 hours of lab per week Prerequisite: *C*- or better in CIS 2025 or 2262 or 2271
Corequisite: CIS 1120 or MAT 2120

CIS 2025 C Programming (3) **fall/spring**
This course teaches the student to write programs using the C language. All fundamental features of C are covered including arrays, functions, pointers, file I/O, string manipulation, and preprocessor directives. This course emphasizes good software design techniques, programming style, and documentation. No prior programming experience is required.
2 hours of lecture, 2 hours of lab per week
[Course fee: $85]

CIS 2151 Computer Networks I (4) **spring**
This course introduces the student to network protocols and covers physical, data link, network, transport, and application layer protocols. The TCP/IP protocol suite is discussed in detail. Topics include Ethernet, connectionless protocols, connection-oriented protocols, and application protocols such as DNS, DHCP, and HTTP. The student learns about both hardware and software troubleshooting tools, security issues, and current topics such as IPv6. Hands-on experience working with networking equipment and use of network simulation tools is used throughout the course.
3 hours of lecture, 2 hours of lab per week

CIS 2230 System Administration (4) **spring**
In this course, the student explores the basics of system management. The course provides the student with enough theory to understand how operating systems work and to interpret the output of various management tools. It also covers practical issues in system administration including process, memory, and file system monitoring and performance tuning. Computer security is also discussed.
3 hours of lecture, 2 hours of lab per week Prerequisite: C- or better CIS 2025 or 2262 or 2271

CIS 2235 Advanced System Administration (4) **spring**
This course focuses on management tasks and considerations for enterprise-level information technology systems. Topics include network infrastructure components, security devices, VoIP systems, service delivery systems, and system management applications.
3 hours of lecture, 2 hours of lab per week Prerequisite: CIS 2230

CIS 2260 Object-Oriented Programming (3) **fall**
This course introduces the student to the use of strong specifications and abstract data types in object-oriented programming as well as the basics of object-oriented design.
3 hours of lecture per week Prerequisite: *C*- or better in CIS 2262 or 2271

CIS 2261 Introduction to Java Programming I (4) **fall**
This course is the first of a two-semester series that introduces the basic concepts and techniques of Java. Essential topics include program structure; primitive and string data types; operators; expressions; control structures; static methods (including an introduction to recursion); and classes and objects.
3 hours of lecture per week, 2 hours of lab per week

CIS 2262 Introduction to Java Programming II (3) **spring**
This course is a continuation of CIS 2261 and covers additional concepts in object-oriented programming such as inheritance and polymorphism; exceptions and exception handling; the Java collections framework (lists, sets, maps, and iterators); creating and using packages; and creating graphical user interfaces.
3 hours of lecture per week Prerequisite: CIS 2261

***CIS 2271 Java Programming* (4)** **fall**
This course introduces the basic concepts and techniques of Java, including object-oriented programming (OOP). Essential topics include program structure; primitive and string data types; operators; expressions; control structures; static methods (including an introduction to recursion); exception handling; use of library packages; and top-down design. OOP concepts include classes and objects; instance methods and constructors; inheritance; polymorphism; and an introduction to object-oriented design. Time permitting, the course may cover the basics of graphical user interface construction.
3 hours of lecture, 2 hours of lab per week

CIS 2320 Software Quality Assurance & Testing (3) **fall**
This course introduces the student to the concepts, techniques, and tools used for evaluating and ensuring the quality of computer software. Topics include dimensions and implications of quality, code reviews, test construction, test coverage metrics, partition testing, website testing, and current test support tools, including issue tracking systems.
3 hours of lecture per week Prerequisite: C- or better in CIS 2025 or 2262 or 2271

CIS 2450 Advanced Web Technologies (3) **spring**
This course introduces the student to advanced use of web technologies methods and practices. Discussion includes the use of technologies such as JavaScript, jQuery, CSS preprocessors, web APIs, and major web development frameworks which are all implemented in the lab.
3 hours of lecture per week Prerequisite: CIS 1151

CIS 2730 Software Engineering Projects (3) **spring**
This capstone course involves the development of a group project. The development effort is combined with an introduction to systems development and life cycle. The student receives an introduction to oral presentations of technical information to a technical audience.
2 hours of lecture, 2 hours of lab per week Prerequisite: C- or better in CIS 2025 or 2262 or 2271

CIS 3010 Database Systems (4) **spring**
This course covers methods for designing relational databases; the use of SQL to define and access a database; and the use of production-level database management systems to implement a relational database system. The student is required to complete a project in which they either implement a real-world example relational database or research a specific database topic not covered during class. Additional topics that may be discussed as time and class interest permit include integrating databases into applications or websites; alternative database paradigms; database design/engineering tools; and underlying implementation of databases.
3 hours of lecture, 2 hours of lab per week Prerequisite: CIS 1151; C- or better in CIS 2261 or 2271

CIS 3012 C++ Programming (3) **spring**
This course covers the syntax and semantics of the major C++ features. Topics include data abstraction, object-oriented programming, and generic programming, including the use of the standard template library. C++ 2011 is used and features added to that standard are described. Discussion of C++ best practices and design techniques is incorporated throughout.
3 hours of lecture per week Prerequisite: CIS 2010 or 2025; CIS 2260

CIS 3030 Programming Languages (3) **fall**
This course covers fundamental concepts in programming language design from the perspective of the practical programmer. Topics include the syntactic representation of programs; functional programming; static vs. dynamic languages; select advanced object oriented topics; and an introduction to the theory of computation as it applies to programming languages. The student gains useful experience with at least two new languages.
3 hours of lecture per week Prerequisite: CIS 2260
Corequisite: CIS 3050

CIS 3050 Algorithms & Data Structures (3) **fall**
This course focuses primarily on the implementation of various important algorithms and data structures. It contains some theory, but the theory content is minimized in favor of a more rigorous treatment of implementation techniques. The course covers classic topics such as lists, trees, hash tables, graphs, sorting, and string matching. Other topics such as encryption, data compression, and image processing are covered as time allows.
3 hours of lecture per week Prerequisite: CIS 2010; CIS 2025 or 2260

CIS 3152 Network Programming (3) **as required**
This is a course in network programming and topics include client/server programming with sockets for TCP and UDP; programming at least one application level protocol such as HTTP or SMTP/MIME; an introduction to character sets; and at least one remote procedure call system (ONC RPC, Ice, etc.) An introduction to XML and the use of XML libraries is also presented. Proper error handling techniques are discussed throughout.
3 hours of lecture per week Prerequisite: CIS 2151; CIS 2010 or 2025; CIS 2262 or 2271

CIS 3170 The History of Computation (3) **fall**
In this course, the history of computers and early calculators is examined. The student learns the principles of early computational devices and investigates how the concepts inherent in these devices are implemented in modern computers. Particular attention is focused on Boolean logic, Frege formula language, flow charts, state machines, and Turing machines. The implications of Shannon's law and Moore's law are presented.
3 hours of lecture per week

CIS 3210 Network Routing & Switching Concepts (4) **fall**
This course teaches the student the operation of routers and switches in a network architecture. The student learns how to configure routers and switches. Concepts such as virtual LAN (VLAN) configurations; routing concepts; inter-VLAN routing; static routing; introduction to OSPF; access control lists and implementation; and configuration of DHCP and NAT in a network configuration are covered along with IPv4 and IPv6 concepts.
3 hours of lecture, 2 hours of lab per week Prerequisite: CIS 2151

CIS 3250 Advanced Network Architectures (4) **spring**
This course teaches the student how to implement, monitor, deploy, and maintain a network in a converged enterprise environment. The student learns how to plan, configure, and verify the implementation of complex enterprise switching solutions. The course also covers the secure integration of VLANs, WLANs, security, and video into networks. Key concepts covered include network implementations such as HSRP, STP, EtherChannel, wireless technologies, advanced OSPF, EIGRP, and frame relay.
3 hours of lecture, 2 hours of lab per week Prerequisite: CIS 2151

CIS 3310 Artificial Intelligence (3) **as required**
In this course, the student learns the algorithms and data structures used in artificial intelligence and programs a range of approaches that computers use to emulate intelligence: planning, knowledge representation, learning, decision-making, and game-playing.
3 hours of lecture per week Corequisite: CIS 3050

CIS 4011 Information Warfare (3) **spring**
This course is a strategic level examination of the use of the information instrument of national power. Topics covered include cyberspace operations, computer network operations, information operations, military strategy, and civil military relations.
3 hours of lecture per week Prerequisite: CIS 4040

CIS 4020 Operating Systems (4) **fall**
In this course, the student examines the internal workings of modern operating systems. Topics include multiprocessing, memory management, file systems, device drivers, distributed operating systems, and real time operating systems. As part of the course, the student writes a kernel module or a device driver for an operating system chosen by the instructor.
3 hours of lecture, 2 hours of lab per week Prerequisite: CIS 3050

CIS 4040 Computer Security (3) **fall**
This course focuses on security issues associated with computers and computer networks and begins by covering cryptographic topics such as symmetric and public key cryptography, digital signatures, secure hashes, random number generation, and message authentication codes. Network security topics are also covered including secure protocols (SSL/TLS, IPsec), network attack methods, network authentication protocols (Kerberos), and firewalls. Finally, the course covers host security matters such as building secure software, auditing, and intrusion detection.
3 hours of lecture per week Prerequisite: CIS 2151, 2230; C- or better in CIS 2025 or 2262 or 2271

CIS 4050 Compiler Design (3) **spring**
This course familiarizes the student with how computer languages are implemented. Throughout the course, the student writes a small compiler for a simplified programming language specified by the instructor, using compiler construction tools such as lexical analyzer generators and parser generators as well as creating some hand-built components. Although some theory is presented, the emphasis is on implementation. The programming is done in C or Java at the instructor's discretion.
3 hours of lecture per week Prerequisite: CIS 3030, 3050

CIS 4080 Network Security (3) **as required**
This course teaches the student how to implement, monitor, deploy, and maintain a secure network. The student learns how to implement on Cisco routers (AAA, IP-sec, secure Layer 2 technologies); implement firewall technologies; IDS and IPS fundamentals; and mitigation technologies for email, web-based, and endpoint threats. Comprehensive assignments using the Cisco Packet Tracer network simulator emphasize hands-on learning.
3 hours of lecture per week Prerequisite: CIS 3210 or 3250

CIS 4120 Systems Analysis & Design (3) **spring**
This course develops the student's skills to develop, refine, and communicate requirements and designs as related to computer systems. This course is reading- and writing-intensive.
3 hours of lecture per week

CIS 4140 Human Computer Interaction (3) **as required**
The course covers the design, implementation, and evaluation of user interfaces for computers and other modern, complex electronic equipment.
3 hours of lecture per week Prerequisite: CIS 1152 or 2260

CIS 4150 Software Engineering (3) **fall**
This course covers the product life cycle for a software product. Material covered includes both common current practices in a variety of industrial settings as well as more recent leading-edge advances.
3 hours of lecture per week

CIS 4210 Computer Graphics (3) **as required**
This course deals with the computer generation of realistic images of two-dimensional and three-dimensional scenes. The course involves substantial computer programing.
3 hours of lecture per week Prerequisite: CIS 3050; MAT 1520

CIS 4220 Physical Simulations (3) **as required**
This course combines numerical programming techniques with Newtonian physics and calculus to give the student an understanding of how physical systems can be simulated on a computer. Topics include the simulation of rigid bodies, soft bodies, fluids, and collision detection. This course emphasizes applications rather than mathematical theory and entails a significant amount of programming.
3 hours of lecture per week Prerequisite: *C*- or better in CIS 2025 or 2262 or 2271; PHY 1041

CIS 4230 Parallel Programming (3) **as required**
This course examines the applications, algorithms, construction, configuration, and performance of parallel programs. Topics include shared memory parallelism using POSIX threads and OpenMP and multi-machine parallelism using MPI. Parallel programming on modern GPU devices is also introduced.
3 hours of lecture per week Prerequisite: CIS 2230, 3050

CIS 4240 Ethical Hacking & Network Defense (3) **as required**
This course teaches the student how hackers attack and how to protect systems from such attacks. The student learns legal restrictions and guidelines and abides by them. The student performs hands-on exercises which emphasize and enforce skills such as attacking and defending; using port scans; footprinting; exploiting vulnerabilities; buffer overflow exploits; SQL injection; privilege escalation; MAC spoofing; and backdoor attacks.
3 hours of lecture per week Prerequisite: CIS 2151

CIS 4241 Advanced Ethical Hacking (3) **as required**
This class is an exploration of advanced cybertechnology threats and tactics and covers the employment of advanced tactics in the context of a penetration test. Topics covered include planning, web threats, mobile threats, wireless hacking, protocol abuse, malware creation, social engineering, and evasion of defensive tools.
3 hours of lecture per week Prerequisite: CIS 4240

CIS 4310 Computer Forensics (3) **fall**
This class introduces digital forensic methods, practices, technology, and legal concerns. The student considers issues of incident response and handling, data collection, chain of evidence, data analysis, cryptanalysis, steganography, and report writing.
3 hours of lecture per week Prerequisite: CIS 2151, 2230

CIS 4721 CIS Senior Project I (2) **fall**
The course is largely a self-directed senior project in the student demonstrates mastery of the subjects covered in their computing program. This first part of a two-part course sequence, this first semester offering involves defining the eventual project and learning any necessary technologies.
1 hours of lecture, 2 hours of lab per week

CIS 4722 CIS Project II (3) **spring**
This course is the completion of the senior project begun in CIS 4721, culminating in a public presentation of the project.
1 hour of lecture, 4 hours of lab per week Prerequisite: CIS 4721

CIS 5020 Advanced Operating Systems (4) **fall**
3 hours of lecture, 2 hours of lab per week

CIS 5050 Advanced Data Structures & Algorithms (3) **spring**
This course prepares the graduate student to understand, implement, and analyze sophisticated algorithms and data structures.
3 hours of lecture per week Prerequisite: CIS 3050

CIS 5080 Advanced Network Security (3) **fall**
This course teaches the student how to implement, monitor, deploy, and maintain a secure network. The student learns how to implement on Cisco routers (AAA, IP-sec, secure Layer 2 technologies); implement firewall technologies; IDS and IPS fundamentals; and mitigation technologies for email, web-based, and endpoint threats. Comprehensive assignments using the Cisco Packet Tracer network simulator emphasize hands-on learning.
3 hours of lecture per week Prerequisite: CIS 2151

CIS 5120 Advanced Systems Analysis & Design (3) **spring**
3 hours of lecture per week

CIS 5130 Analysis of Software Artifacts (3) **fall**
The student completing this course can analyze the range of artifacts created during the software development process, ranging from requirements and design documents through source code and to test results. The approaches covered include both heuristic and formal analyses.
3 hours of lecture per week Prerequisite: CIS 4050, 4120, 4150

CIS 5140 Software Architecture (3) **spring**
This course is a detailed consideration of software design from the high-level perspective and examines a range of distinct architectural styles and considers their appropriateness for a range of problems.
3 hours of lecture per week Prerequisite: CIS 4120, 4150

CIS 5150 Advanced Software Engineering (3) **fall**
3 hours of lecture per week

CIS 5210 Advanced Computer Graphics (3) **as required**
3 hours of lecture per week Prerequisite: CIS 3050; MAT 1520

CIS 5220 Advanced Physical Simulations (3) **as required**

This course combines numerical programming techniques with Newtonian physics and calculus to give the student an understanding of how physical systems can be simulated on a computer. Topics include the simulation of rigid bodies, soft bodies, fluids, and collision detection. This course emphasizes applications rather than mathematical theory and entails a significant amount of programming.
3 hours of lecture per week Prerequisite: C- or better in CIS 2025 or 2262 or 2271; PHY 1041

CIS 6050 Advanced Compiler Design (3) **spring**
3 hours of lecture per week Prerequisite: CIS 3030, 3050

CIS 6721 Master's Project (1-6) **as required**
This course supports a significant practical individual or small group project taken to completion and presented to the community.
1-6 hours of project lab per week

CIS 6740 Graduate Seminar I (1) **fall**
This is a paper-reading and discussion course in which the instructor chooses a selection of papers appropriate to the class.
1 hour of seminar per week

CIS 6741 Graduate Seminar II (1) **spring**
This is a paper-reading and discussion course. Each student is responsible for choosing at least one paper and leading discussion.
1 hour of seminar per week Prerequisite: CIS 6740

Construction Management (CPM)

CPM 1000 CPM Freshman Seminar (1) **fall**
This course facilitates a successful transition to college and focuses on orientation to college and academic success strategies. Topics include student rights and responsibilities; student grading and graduation requirements; student information technologies and database orientation; campus resources; time management; note taking; introduction to career opportunities; and program-specific topics including construction program issues, the building construction industry, and professional development. Pass/No Pass.
1 hour of seminar per week

CPM 1010 Electrical/Mechanical Systems (3) **spring**
In this course, the student is introduced to the major environmental systems in a building: plumbing; heating, cooling, and ventilation; and electrical and illumination. An introduction to the influence of the natural environment on the built environment and a consideration for how these effect energy use and conservation is included. The student also studies the building codes that govern the design of the various environmental systems.
2 hours of lecture, 3 hours of lab per week Prerequisite: CPM 1021, 1031

CPM 1021 Construction Graphics I (2) **fall**
This course prepares the student to interpret construction drawings by teaching them to make their own basic architectural drawings by hand. The student learns to draw plans, elevations, sections, and details and to understand how they relate to each other. Informal sketching techniques are practiced and used throughout. Spreadsheets are introduced with applications appropriate to construction including calculations, quantities, and estimates. No prior computer training is required.
1 hour of lecture, 2 hours of lab per week

CPM 1022 Construction Graphics II (2) **spring**
This course is a continuation of CPM 1021 in which the student experiences blueprint reading of residential and

commercial construction plans using classroom instruction, drawing of print details, and plan-reading exercises. The student performs basic material takeoff techniques used in estimating and applies CAD basic 2D mechanical drafting techniques to drawing plans and design details.
1 hour of lecture, 2 hours of lab per week — Prerequisite: CPM 1021

CPM 1031 Residential Construction Systems (3) — **fall**
In this course, the student studies residential construction methods and materials; structural soils; an introduction to concrete foundations; and wood frame construction of floors, walls, and roofs. The student is introduced to estimating, building codes material takeoff, and structural loads. Stairs and roof rafters are also explained.
3 hours of lecture per week — Corequisite: CPM 1032

CPM 1032 Construction Lab (2) — **fall**
This course introduces the student to construction materials and methods, tools, and safety. The student works on small building projects and mockups to learn material placement, concrete work, carpentry, siding, and roofing techniques in jobsite conditions.
6 hours of lab per week — Corequisite: CPM 1031

CPM 1111 Commercial Construction Systems (4) — **spring**
This course introduces the student to the construction materials and installation methods used in commercial projects. The student studies soils and foundation types; heavy timber frame construction; masonry, concrete and steel construction systems; and commercial roofing, insulation, and cladding systems as well as the IBC building code.
4 hours of lecture per week — Prerequisite: CPM 1031

CPM 2010 Construction Estimates I (3) — **fall**
This course introduces the estimating principles and procedures used to determine detailed cost estimates for construction bidding purposes. Both residential and light commercial applications are addressed. Topics presented include organizing an estimate; methods of pricing labor, materials, and equipment; direct and indirect overhead costs; units of measure; computer spreadsheets; and profit. An introduction to contracts and types of bids is provided along with familiarization with computer estimating software applications.
2 hours of lecture, 3 hours of lab per week — Prerequisite: CPM 1022, 1111; MAT 1210 or 1311

CPM 2020 Construction Project Management (3) — **fall**
This course introduces the student to the principles of construction project management. Included are design and construction processes; contract documents; organization of the construction firm; subcontractor relationships; records and reports; cost control methods and procedures; schedule control; construction safety; and quality control. Bar chart and critical path method scheduling are covered and an introduction to design-build and construction manager contracting is included.
3 hours of lecture per week

CPM 2030 Elementary Theory of Structures (4) — **spring**
This course introduces the student to preliminary analysis of structural design of building components and frames and serves as an introduction to statics and strengths of materials, including properties of materials used in residential and commercial construction. The course is an in-depth study of building static loads referencing concrete, steel, wood, and pre-engineered wood products.
3 hours of lecture, 3 hours of lab per week — Prerequisite: CPM 1111; MAT 1210 or 1311; PHY 1030

CPM 2050 Construction Management Software (1) — **fall**
This course exposes the student to the software used in construction management, particularly spreadsheets and scheduling. Direct instruction is provided by working through tutorial exercises and creating functional spreadsheets and project schedules.
3 hours of lab per week — Prerequisite: CPM 1022

CPM 2060 Field Engineering (3) — **fall**
This course introduces the student to the fundamentals of construction field engineering, survey, and building layout. The student learns the use and care of survey equipment while performing field practices such as distance measuring; building layout; profile and cross-sectional leveling; and traversing. Trigonometry and geometry are used to balance angles, make distance corrections, and compute areas and volumes.
2 hours of lecture, 3 hours of lab per week — Prerequisite: MAT 1210 or equivalent
[Course fee: $25]

CPM 2720 Construction Supervision (1) — **fall**
This is an elective course for CM seniors. The student gains practice supervising first-year students in CPM 1032 and managing a CM jobsite. The course is repeatable for additional credit.
3 hours of lab per week — Prerequisite: Instructor permission

CPM 2730 Construction Seminar & Project (3) — **spring**
This seminar weaves prior coursework into workplace-ready application. In the lab, the student reads and interprets contracts and specifications for commercial projects of significant scope and develops an estimate of construction time, a project schedule, a schedule of values, and a safety plan through individual and group work.
2 hours of lecture, 3 hours of lab per week — Prerequisite: Sophomore standing

CPM 2801 Construction Internship (0) **summer**

This course is a required part of the CPM curriculum and involves a ten-week summer cooperative education experience that broadens the student's understanding of real-world construction and management. The internship review takes place in CPM 2802 in the subsequent fall term. Pass/No Pass.

Prerequisite: Department permission

CPM 2802 Construction Internship Review (1) **fall**

This course is review portion of the internship in CPM 2801. Pass/No Pass.

[Course fee: $250] Prerequisite: CPM 2801

CPM 3010 Construction Estimates II (3) **spring**

This course provides an advanced understanding of the theory and practice of construction estimates. Estimating means and methods of a broad range of construction projects is included. Industry projects and case studies demonstrate advanced estimating concepts and processes. Building Information Modeling, quality takeoff, and estimating software are utilized.

2 hours of lecture, 2 hours of lab per week Prerequisite: CPM 2010

CPM 3020 Construction Documents (3) **spring**

This course covers analysis, creation, and organization of construction documents. The student conducts take-offs and divisional cost controls; creates and tracks submittals; shops drawings; makes requests for information and proposals; interprets specifications, contracts, and architectural, civil, and structural drawings; and interprets LEED, International Building Code, and local zoning and life safety requirements.

3 hours of lecture per week Prerequisite: CPM 2020

CPM 3030 Concrete & Steel Lab (2) **spring**

This course prepares the student for the American Concrete Institute's Field 1 Concrete Certificate. The student interoperates soil sieve analysis relative to concrete characteristics. Concrete batch and strength are examined. Methods of testing are taught and practiced through laboratory experience and analytical reporting. Structural and thin walled steel are presented and the student works with these products in a laboratory setting. A visit to a batch plant or bridge reconstruction usually concludes the lab.

1 hour of lecture, 2 hours of lab per week Prerequisite: CPM 1111

[Course fee: $150]

CPM 3130 Construction Soils (3) **fall**

In this course, the student develops a basic understanding of soils in construction and engineering industries. The course stresses the applied aspects of soil as a building material and as a medium in other industries such as wastewater design, wetlands, and hazardous waste spills. Topics include excavation; grading; soil investigation techniques; erosion prevention and control; compaction; and foundations in addition to soil basics of texture, structure, soil formation, soil water movement, and soil classification. This course focuses on hands-on familiarity with soils, soil characteristics, maps, tools and resources with some technical writing.

2 hours of lecture, 3 hours of lab per week Prerequisite: MAT 1210 or placement level 2

CPM 4010 Contract Negotiations (3) **fall**

This course improves the student's skills in all phases of negotiations: understanding negotiation theory as it applies to single and multiparty negotiations; buyer-seller transactions and the resolution of disputes; development of negotiation strategy; and the management of integrative and distributive aspects of the negotiation process. The course is based on a series of simulated negotiations in a variety of contexts including one-on-one, multi-party, third-party, and team negotiations.

3 hours of lecture per week Prerequisite: CPM 2020

[Course fee: $60]

CPM 4030 Construction Safety & Risk Management (3) **fall**

This course is a study of safety problems in the construction and manufacturing environment with emphasis on the day-to-day activities of the construction safety coordinator. Ethical, moral, productivity, and monetary implications of the practices of safety are considered. The course culminates in the creation of a workplace safety plan.

3 hours of lecture per week

CPM 4040 Construction Scheduling (3) **fall**

This course explores time management of construction projects. Topics include project scheduling; durations and dependencies; efficiency calculations; critical path method; and cost control models. Industry examples and case studies are used to demonstrate resource allocation, dispute resolution, and productivity. Computer applications for construction scheduling are used to create Gantt charts, network diagrams, and progress reports.

2 hours of lecture, 2 hours of lab per week Prerequisite: CPM 2802 or 4802; CPM 3010

CPM 4120 Project Planning & Finance (3) **spring**

This course is an examination of issues in project planning and financial management, along with running a successful construction company. The student learns markups; margins; pricing; fixed and variable costs; and cost controls. The course uses computerized construction management and accounting software.

3 hours of lecture per week Prerequisite: ACC 1020 or equivalent

CPM 4130 Construction Superintendency (3) **spring**
This course covers the duties and responsibilities of on-site construction leaders. Emphasis is on the procedures, methods, and administration documentation system used by the construction contractor during construction and post-construction phases of a project. Quality control and reporting and motivational and leadership concepts are discussed as they apply to construction.
3 hours of lecture per week — Prerequisite: Junior standing

CPM 4140 Construction Contracts (3) **spring**
This course provides an in-depth study of the role of contracts in the construction industry. The course focuses on the different contractual terms and how those terms control risk allocation and the relationships between parties. Legal considerations of standardized construction contracts are examined. The student develops skills in analyzing contracts with an emphasis on dispute prevention.
3 hours of lecture per week — Prerequisite: CPM 2020

CPM 4730 Preconstruction Services (3) **fall**
This course focuses on the development of comprehensive preconstruction proposals for horizontal and vertical construction. It includes presentation skills and practice to tailor detailed cost analyses, schedules, labor requirements, and methods of construction for multiple construction projects.
3 hours of lecture per week — Prerequisite: Senior standing
[Course fee: $200]

CPM 4801 CPM Senior Summer Internship (0) **summer**
This internship is an optional introduction to commercial construction workplaces. Emphasis is on field operations and management applications as they apply to commercial, retail, healthcare, industrial, or heavy/highway construction projects. Pass/No Pass.
Prerequisite: CPM major in good academic standing

CPM 4802 CPM Senior Summer Internship Review (1) **fall**
This course is used to review and evaluate the effectiveness of the internship experience in CPM 4801 and quantify learning outcomes as they pertain to the major and to the construction practices career field. Pass/No Pass.
[Course fee: $250] — Prerequisite: CPM 4801

Dental Hygiene (DHY)

DHY 1011 Pre-clinical Dental Hygiene (5) **fall**
This course introduces the didactic and clinical framework necessary to the practice of dental hygiene. The didactic component covers preventive dental hygiene theory. The primary emphasis of the clinical component is on learning the techniques of basic dental hygiene instrumentation. The student begins to integrate knowledge of theory and practice through simulated patient experiences on manikins and student partners.
3 hours of lecture, 6 hours of lab per week — Corequisite: DHY 1021
[Course fee: $115]

DHY 1012 Clinical Dental Hygiene I (5) **spring**
This course is a continuation of DHY 1011 and provides the clinical and didactic framework necessary to the practice of dental hygiene. Emphasis is placed on the clinical component of practice. The student integrates knowledge of dental hygiene theory and practice by providing dental hygiene care to consumer patients during the second half of the semester. The didactic and clinical components of this course challenge the student to develop problem-solving and critical-thinking skills.
2 hours of lecture, 8 hours of clinic per week — Prerequisite: DHY 1021
[Course fee: $75] — Corequisite: DHY 1022

DHY 1021 Oral Tissues I (3) **fall**
This course introduces the student to the common terms used in dental hygiene. The anatomy of the teeth and oral structures are examined. There is emphasis on identification of primary and permanent teeth. The course includes an introduction to general histology and embryology with emphasis on the microscopic structures of enamel, dentin, pulp, cementum, periodontal ligament, alveolar bone, gingiva, oral mucosa, and the tongue.
2 hours of lecture, 2.5 hours of activity per week — Corequisite: DHY 1011

DHY 1022 Oral Tissues II & Medical Emergencies (3) **spring**
This course prepares the student to prevent and manage life-threatening medical emergencies in dental practice. Emphasis is placed on reducing the likelihood of life-threatening emergencies; recognizing early warning signs and symptoms; implementing appropriate measures for prevention; and proper management of medical emergencies. Basic cell histology, salivary gland histology, and paranasal sinuses and skeletal, muscular, cardiovascular, lymphatic, and nervous systems as they relate to the head and neck are presented. Study of the embryologic development of the face, palate, tongue, and odontogenesis are covered in detail.
2 hours of lecture, 2 hours of activity per week — Prerequisite: DHY 1021
Corequisite: BIO 2012; DHY 1012

DHY 1030 Dental Radiology (3) **fall**
Dental Radiology is the study, demonstration, and practice of the fundamentals of dental x-ray production and intraoral and extra-oral radiographic techniques utilizing digital imaging. The student learns to recognize the

radiographic appearance of normal anatomical structures and common oral disorders.
2 hours of lecture, 2 hours of lab per week Prerequisite: BIO 2012; DHY 1022

DHY 2010 Dental Materials (3) spring
This course emphasizes the clinical and theoretical concepts of dental materials and their clinical application. The fundamental concepts of modern chemistry as they relate to the manipulation and use of dental materials are also addressed. The course provides the student with adequate opportunity to manipulate materials introduced during the didactic portion of the course. The study of dental materials and their properties provides the student with knowledge of oral health and disease as a basis for assuming the responsibility of assessment, planning, and implementation of preventive and therapeutic services in dental hygiene practice.
2 hours of lecture, 2 hours of lab per week Prerequisite: DHY 2721
[Course fee: $25] Corequisite: DHY 2722

DHY 2020 General Pathology & Clinical Dental Pharmacology (3) spring
This course introduces clinical pathology and pharmacological management in the treatment of dental patients. The student learns to integrate medical diseases commonly found in dental hygiene clinical practice with the pharmacological agents used in the management of those diseases.
3 hours of lecture per week Prerequisite: BIO 2012, 2120; DHY 1030, 2721

DHY 2030 Periodontics (3) fall
This course guides the dental hygiene student toward an in-depth understanding of the recognition, progression, and treatment of periodontal diseases. As it is the dental hygienist who is called upon to provide direct communication to patients in regard to education, prevention, and control of both periodontal diseases and dental caries, they must possess sufficiently detailed knowledge to assist any patient to better understand their specific dental condition. Insufficient, inadequate, or faulty understanding on the part of the hygienist regularly shows itself in varying degrees of unsuccessful prevention and incomplete care for patients.
3 hours of lecture per week Prerequisite: BIO 2012; DHY 1012, 1022
Corequisite: DHY 1030, 2721

DHY 2210 Community Oral Health I (2) fall
This course introduces the concepts of community oral health with emphasis on advanced research designs, community health issues, and the function of public health programs. It also introduces sociological study with an emphasis on core models and concepts associated with dominant sociological perspectives.
2 hours of lecture per week Prerequisite: DHY 2010, 2722
Corequisite: DHY 3821

DHY 2211 Community Oral Health II (1) spring
This course is a continuation of DHY 2210. The student uses knowledge gained through that course to plan, implement, and evaluate a semester-long community outreach project.
1 hour of lecture per week Prerequisite: DHY 2210, 3821
Corequisite: DHY 2220, 3822

DHY 2220 Oral Pathology (3) spring
This course integrates the knowledge gained from general pathology and basic anatomical, physiological, and dental sciences with the concepts of diseases. Emphasis is on understanding the etiology, histopathology, and treatment of specific oral diseases. The course supports the importance of a comprehensive medical and dental history and the recognition of clinical signs and symptoms of oral pathology. The process of formulating a differential diagnosis of oral lesions based on this information is also emphasized. Oral neoplasia, pulpal pathology, temporomandibular joint disorder, microbial diseases, and selected systemic diseases are highlighted.
3 hours of lecture per week Prerequisite: DHY 3821
Corequisite: DHY 3822

DHY 2721 Clinical Dental Hygiene II (4) fall
The didactic portion of this course is a support system for the second year clinical educational program. This program blends lectures with group discussions to stimulate interest in current clinical situations, theories, and concepts. Emphasis is placed on the clinical care of special populations, adjunct therapies, and expanding the student's dental hygiene knowledge base.
1.5 hours of lecture, 8 hours of clinic per week Prerequisite: BIO 2012; DHY 1012, 1022
[Course fee: $140] Corequisite: DHY 1030, 2030

DHY 2722 Clinical Dental Hygiene III (4) spring
This course is a continuation of DHY 2721 and involves clinical practice with patients from Class 0 to Class 5 periodontal conditions. Children, adults, and special populations are treated.
1.5 hours of lecture, 8 hours of clinic per week Prerequisite: DHY 1030, 2030, 2721
[Course fee: $75]

DHY 3010 Evidence-Based Decision Making in Dental Hygiene (3) fall
This course provides fundamental knowledge about evidence-based decision-making and provides tools and skills needed to locate and review research articles and abstracts quickly and easily so that the student can interpret the literature to provide the best possible care and achieve optimum outcomes for patients.
3 hours of online delivery per week Prerequisite: AS in DHY or instructor permission

DHY 3015 Contemporary Issues in Dental Hygiene (3) **fall**
This course examines current societal and professional issues and their impact on practice. The student examines the roles of the dental hygienist in increasing access to dental care. The student researches and compares traditional and alternative practice models and proposes changes to the health care system to improve delivery. Changing technology in dentistry and dental hygiene; political advocacy; demographic shifts; ethics and professionalism; and the aging of America and its impact on the delivery of dental care are also discussed.
3 hours of online delivery per week — Prerequisite: AS in DHY or instructor permission

DHY 3020 Advanced Periodontics (3) **spring**
This course expands upon the student's existing knowledge of current concepts in periodontology including etiology; associated risk factors; periodontal medicine; assessment; treatment planning; implementation and evaluation of contemporary treatment modalities; and maintenance therapy. The interrelationship of periodontal treatment with other dental specialties is discussed along with an investigation of the periodontal literature. Emphasis is placed on the dental hygienist's role in periodontal therapy.
3 hours of online delivery per week — Prerequisite: DHY 2030, 3010 or instructor permission

DHY 3030 Dental Hygiene Methodology & Leadership (3) **spring**
This course introduces educational concepts and theory relative to dental hygiene education as well as theories, concepts, and principles of leadership for dental hygiene educational and clinical settings. Topics include leadership theories; educational unit lesson plan development and design; goals and objectives; principles of learning; learning styles and motivation; and classroom instruction using educational media and software.
3 hours of online delivery per week — Prerequisite: DHY 3822
Corequisite: DHY 3010

DHY 3821 Clinical Dental Hygiene IV (6) **fall**
This course is a continuation of DHY 2722 involving clinical practice with patients from Class 0 to Class 5 periodontal conditions. Children, adults, and special populations are treated. The administration of local anesthetics is also incorporated.
1.5 hours of lecture, 12 hours of clinic per week — Prerequisite: DHY 2010, 2030, 2722
[Course fee: $165] — Corequisite: DHY 2210

DHY 3822 Clinical Dental Hygiene V (6) **spring**
This course is a continuation of DHY 3821 and involves clinical practice with patients from Class 0 to Class 5 periodontal conditions. Children, adults, and special populations are treated.
1.5 hours of lecture, 12 hours of clinic per week — Prerequisite: DHY 2210, 3821
[Course fee: $100] — Corequisite: DHY 2211, 2220

DHY 4010 Advanced Community Oral Health (3) **fall**
This course introduces comprehensive evidence-based public health practices through the study and evaluation of existing public health programs. Emphasis is placed on the role of evidence-based research as the key to startup and maintenance of successful dental public health programs. The various components of this course aim to stimulate interaction among learners around important problems and issues facing public health with an emphasis on community oral health practices.
3 hours of online delivery per week — Prerequisite: DHY 3010, 3015

DHY 4213 Practice Management (3) **spring**
This course enhances the ability of the student to provide optimum patient care while functioning within an interdisciplinary dental team or alternative practice setting through learning skills including communication, teamwork, funding, and business and management practices. The student focuses on the skills and knowledge necessary for managing a dental practice or an alternative setting to understand those functions that are necessary to improve the delivery of services to patients. The student researches traditional and alternative practice settings and develops and presents their own ideal practice plan.
3 hours of online delivery per week — Prerequisite: DHY 3015, 3020, 4010

DHY 4237 Introduction to Dental Hygiene Research Methods (3) **spring**
This course prepares the student with knowledge of the methodology of research and includes strengths and limitations of quantitative and qualitative research methods while developing methodological skills and proficiency related to research including the development of a review of the literature and research proposal.
3 hours of online delivery per week — Prerequisite: DHY 3015, 3030, or instructor permission

Diesel (DSL)

DSL 1001 Commercial Driver's License Training (3) **fall**
In this course, the student receives the training and seat time necessary to take and pass Vermont's Commercial Driver's License B exam.
3.5 hours of lecture, 1.8 hours of lab per week — Prerequisite: Current driver's license
[Course fee: $1,000-5,000]

DSL 1010 Steering, Suspension Systems, & Alignment (3) **fall**
This course provides a comprehensive study of the theory, design, construction, and repair of suspension, steering, and braking systems in diesel-powered equipment and trucks. Topics include steering systems; con-

ventional suspension systems; air suspension systems; wheels and tires; and alignment.
2 hours of lecture, 3 hours of lab per week

DSL 1020 Diesel Power Systems (4) **fall**
This course provides a comprehensive study of the theory, design, construction, and repair of the diesel power plant. Topics include fixed and mobile diesel power systems; engine design (types and components); definition of power and calculations; engine disassembly, reconditioning, and reassembly; cooling and lubrication systems; breathing and retarding systems; and run-in, performance, maintenance, and failure analysis.
3 hours of lecture, 3 hours of lab per week

DSL 1030 Diesel Electronics Lab (1) **fall**
This course is the companion lab to GTS 1120 and includes the practical application of Ohm's law; Kirchhoff's law; analysis, diagnosis, and repair of faulty electrical circuits; and the diagnosis, replacement, and repair of electrical and electronic components.
3 hours of lab per week Corequisite: GTS 1120

DSL 1050 Preventive Maintenance (3) **spring**
This course provides the student with an understanding of the development and administration of preventive maintenance programs. Topics include PM schedules; types of services; record-keeping; out-of-service vehicles; winterizing; coolants and additives; oil and lubricants; analysis and additives; contamination control; and track maintenance.
2 hours of lecture, 3 hours of lab per week

DSL 1070 Diesel Electrical Systems Lab (1) **spring**
In this course is the companion lab to GTS 1040. The student engages in lab exercises designed to address specific diesel electrical topics including operation and testing of storage batteries, starting systems, charging systems, and basic accessory systems. The student becomes familiar with various types of test equipment, diagnostic charts, and vehicle wiring schematics.
3 hours of lab per week Corequisite: GTS 1040

DSL 1110 Heavy Duty Braking Systems (3) **spring**
This course provides a comprehensive study of the theory, design, construction, and repair of braking systems in diesel-powered equipment and the performance of wheel alignments on trucks. Topics include alignment; air braking systems; hydraulic and air-over-hydraulic braking systems; ABS and electronic brakes; and noise, vibration, and harshness.
2 hours of lecture, 3 hours of lab per week Prerequisite: DSL 1010

DSL 2010 Fuel Systems (4) **fall**
This course provides a comprehensive study of the theory, design, construction, and repair of diesel fuel systems. Topics include an overview of diesel fuel injection systems; the chemistry of combustion; diesel fuel and alternatives; fuel transfer systems; mechanical injector nozzles and Unit Electrical Injectors (UEI); Bosch, Detroit Diesel, Caterpillar, and Cummins DFI systems; governors; system diagnosis and service; and computerized fuel control systems. Light-duty diesel fuel systems are also presented.
3 hours of lecture, 3 hours of lab per week

DSL 2020 Chassis Electrical & Electronic Systems (4) **spring**
This course gives the student a thorough understanding of advanced diesel chassis electrical and electronic systems and teaches diagnostic and troubleshooting skills. Topics include advanced networks and multiplexing, instrument panels, and AC, lighting, wiper/ washer, alarm, collision avoidance, supplemental restraint, ground-based communication, satellite-based communication, and accessory systems.
3 hours of lecture, 3 hours of lab per week Prerequisite: DSL 1060
[Course fee: $15]

DSL 2030 Hydraulics (3) **fall**
This course provides a comprehensive study of the theory, design, construction, and repair of mobile hydraulic systems. Topics include hydraulic systems and components; hydraulic symbols and engineering drawings; pilot systems; and electronic control systems.
2 hours of lecture, 3 hours of lab per week Prerequisite: DSL 1060

DSL 2040 Power Transmission (3) **spring**
This course gives the student a thorough understanding of power transmission systems and teaches diagnostic and troubleshooting skills. Topics include an introduction to power transmissions; clutches and torque converters; manual transmissions; gear theory; planetary gear theory; hydraulic planetary controls and support systems; powertrain management and electronically controlled transmissions; the Allison commercial Electronic Control (CEC) system; the Eaton AutoShift transmission; drive shafts; final drives; and tracks.
3 hours of lecture, 3 hours of lab per week Prerequisite: DSL 1030
Corequisite: DSL 2020

DSL 2801 DPT Summer Internship (0) **summer**
This course requires a 400-hour internship at a diesel repair facility or OEM dealership. Pass/No Pass.
Prerequisite: Department permission

DSL 2802 DPT Summer Internship Review (1) **fall**
This course provides a critique for the internship in DSL 2801. Pass/No Pass.
[Course fee: $250] Prerequisite: DSL 2801

Economics (ECO)

ECO 2060 Survey of Economics (4) **fall**
This course is a study of both micro and macroeconomic principles and concepts. Course topics include scarcity; human economic behavior; supply and demand; economic markets; gross national product; business cycles; unemployment and prices; recession and inflation; fiscal and monetary policy; and international trade.
4 hours of lecture per week

Education (EDU)

EDU 2051 Teaching Methods I (3) **fall**
This course improves the competence, self-efficacy, and career commitment of new CTE teachers entering from their professions so that their students are intellectually and emotionally engaged in rich, academically rigorous activities in which they develop twenty-first century skills. Pass/No Pass.
3 hours of lecture per week Prerequisite: Instructor permission

EDU 2052 Teaching Methods I *(continued)* (3) **spring**
This course is a continuation of EDU 2051. The second of four courses to prepare new CTE teachers in teaching methods, it focuses on further skills to manage the classroom; develop and implement curriculum; and engage in best teaching practices. Pass/No Pass.
3 hours of lecture per week Prerequisite: EDU 2051

EDU 2061 Teaching Methods II (3) **fall**
This course is a continuation of EDU 2052. The third of four courses to prepare new CTE teachers in teaching methods, it focuses on further skills to manage the classroom; develop and implement curriculum; and engage in best teaching practices. This course requires an online component and the student should participate effectively. Pass/No Pass.
3 hours of lecture per week Prerequisite: Instructor permission

EDU 2062 Teaching Methods II *(continued)* (2) **spring**
This course is a continuation of EDU 2061. The final of four courses to prepare new CTE teachers in teaching methods, it focuses on further skills to manage the classroom; develop and implement curriculum; and engage in best teaching practices. This course revisits the year's curriculum, its application to the classroom, and further improvement based on knowledge and experience. Pass/No Pass.
3 hours of lecture per week Prerequisite: EDU 2061

EDU 2115 Issues & Trends in Technical Education (3) **summer**
This course covers current issues in technical education and includes an in-depth examination of the state and federal laws and policies that impact Vermont's career and technical education centers and how these centers can create welcoming, safe, and respectful learning environments for all students. The course is designed for the student who has worked in career and technical education for at least one school year.
3 hours of lecture per week

EDU 2135 Instruction for Students with Special Needs (3) **summer**
This course informs technical educators about how students learn differently. Included is an overview of applicable education laws for students with and without disabilities and how schools must provide multiple layers of support for students; discussion of assessment, eligibility, the special education process, and the components of an Individualized Education Plan, as well as 504 and EST plans; and how technical educators may provide an environment that is more focused on students' strengths than weaknesses. Also addressed is the collaborative role the technical instructor plays in the education plan developed for these learners.
3 hours of lecture per week

EDU 2650 Education Capstone (1) **fall**
This course helps the student create a professional portfolio to be used for Level I Vermont Teacher Licensure. It reviews the Results Oriented Program Approval manual, which serves as a guide to compiling a targeted, thorough, and reflective portfolio. Pass/No Pass.
1 hour of lecture per week Corequisite: EDU 2061

EDU 2802 Educational Externship (1) **fall**
This is an education externship for the CTE student taken in conjunction with EDU 2061. Pass/No Pass.
Corequisite: EDU 2061

EDU 3550 Technology in the Classroom (1) **fall**
This course examines the use of instructional and assistive technologies available for teachers to enhance and supplement their instruction in the classroom. The student explores and uses different tech-related products while considering the ethical and personal responsibilities of teachers in regard to technology in the classroom. Pass/No Pass.
Corequisite: EDU 2061

Electromechanical Engineering Technology (ELM)

ELM 3015 Sensors & Instrumentation (3) **spring**
This course introduces the type of sensors used in research and industry to measure physical and mechanical parameters and the standard methods of interfacing these devices. Discussion includes investigation of the underlying physical phenomenon which each transducer exploits and various signal conditioning and interfacing strategies. Typical devices covered include strain gages, LVDTs, load cells, pressure transducers, tachometers, accelerometers, temperature sensors, level sensors, and optical sensors.
2 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1110 or 2072; MAT 1520; PHY 1042,
[Course fee: $375] Corequisite: CIS 2025; ELT 1032; MAT 2532

ELM 4015 Electromechanical Power Systems (3) **fall**
This course provides a detailed analysis of the components in high-power hydraulic, pneumatic, and electrical systems. Topics include pumps, pneumatic circuits, safety valves, actuators, electric motors, generators, transformers, relays, solenoids, and high-power semiconductors. Emphasis is placed on specifications (power ratings), typical uses, and energy conversion issues. Programmable controllers are introduced to demonstrate control and sequencing in these systems.
3 hours of lecture Prerequisite: ELM 3015; MAT 3170
Corequisite: ELM 4241

ELM 4231 Control Systems I (3) **fall**
This course introduces analytical system modeling and the design of controllers for closed-loop electrical and mechanical systems. Topics include finite state machine design and implementation; the development of dynamic systems models using Laplace techniques; block diagram system representation; time-domain and frequency-domain system analysis; the determination of system stability; system error computation; an introduction to controller design; and an introduction to the design of discrete-time controllers using z-transform methods. MATLAB with Simulink is required.
3 hours of lecture per week Prerequisite: ELT 2061; MAT 3170

ELM 4232 Control Systems II (3.5) **spring**
This course is a continuation of ELM 4231. It introduces advanced system design methodology for complex second-order and higher-order systems. Topics include system modeling methods, performance parameter design trade-offs, the design of multiple feedback loop controllers, z-transforms, and state-space design.
3 hours of lecture, 1.5 hours of lab per week Prerequisite: ELM 4231
[Course fee: $75]

ELM 4241 Senior Lab (1) **fall**
Lab projects performed in this course are designed to enhance the classroom learning in ELM 4015 and ELM 4231. myRIO is required.
3 hours of lab per week Corequisite: ELM 4015 or department permission
[Course fee: $125]

ELM 4701 Electromechanical Project I (2) **fall**
This course emphasizes project design, planning, and manufacturing issues. Topics include planning and budgeting; safety in the design; design for manufacturability; fabrication techniques; testing for safety and reliability; and quality control. The student is given a small electrical/electromechanical design on which to apply the lecture material. The student also selects and begins planning a team-oriented project that is completed in ELM 4702. The project must have major software, electrical, and mechanical components.
1 hour of lecture, 3 hours of laboratory per week Prerequisite: Senior standing
[Course fee: $200] Corequisite: ELM 4015, 4231

ELM 4702 Electromechanical Project II (3) **spring**
This course is a continuation of ELM 4701 and deals primarily with issues of large-scale projects. Coordination between the members of the design teams is stressed with frequent seminars and mini-presentations to communicate the design and the team's progress. A major presentation of the team project is required at the end of the semester.
1 hour of lecture, 6 hours of laboratory per week Prerequisite: ELM 4701
[Course fee: $200] Corequisite: ELM 4232, ELT 3040

Electrical Engineering Technology (ELT)

ELT 1015 Introduction to Engineering (1) **fall**
This course facilitates a successful transition to college and introduces engineering tools and strategies. It focuses on orientation, success strategies, and professional development. Topics include student rights and responsibilities; grading and graduation requirements; campus resources; time management; note taking; career opportunities; and program-specific topics. The course provides hands-on experience using technical software and creating technical documentation using software programs including Word, Excel, LabVIEW, and MultiSim. Topics include terminology, layout, chart creation, effective chart usage, and integrating text and graphics.
3 hours of lab per week
[Course fee: $90] Corequisite: ELT 1031; MAT 1311

ELT 1031 Electrical Circuits I (4) **fall**
This course is an introductory study of DC and AC electrical circuits. Content includes the basic ideas of electrical charge, current, voltage, resistance, energy, power, capacitance, inductance, and the transient behavior of RC and RL circuits. For AC, the concepts of frequency, period, phase, and magnitude of sine waves are developed. The electrical circuit parameters are studied as phasors and complex numbers and expressed in polar and rectangular form. Major AC topics studied include reactance, impedance, power, and resonance. Electric circuit theory includes Ohm's law; Kirchhoff's laws; series and parallel circuits; and electrical sources. Also introduced are voltage and current dividers and Thevenin's Theorem. Lab exercises develop the use of basic measurement equipment, such as the ammeter, voltmeter, and oscilloscope, while verifying the concepts studied in lectures.
3 hours of lecture, 3 hours of lab per week
[Course fee: $50] Corequisite: ELT 1015; MAT 1311

ELT 1032 Electrical Circuits II (4) **spring**
This course is a continuation of ELT 1031. Circuit analysis using advanced network theorems and techniques is introduced. Topics such as superposition; mesh and nodal analysis; Thevenin's theorem; and controlled sources are investigated. Other topics include bridges, power factor correction, transformers, polyphase circuits, filters, parallel resonance, frequency response, and response to non-sinusoidal signals. Lab exercises provide experience in using oscilloscopes, function generators, and frequency counters on circuits, demonstrating the concepts developed in lectures.
3 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1031; MAT 1312
[Course fee: $50]

ELT 1110 Introduction to Digital Circuits (3) **spring**
This course introduces basic logic principles, logic circuit definition, and binary number theory. The concepts of combinational logic circuits are developed along with logic circuit generation, minimization, and construction. The course deals with memory and sequential logic circuits including counters, shift registers, and random access memories. State machines are discussed and illustrated through more complex systems. A strong working knowledge of modern CAD tools and technologies, including VHDL and circuit simulators, as well as the function and application of programmable logic devices (PLDs) is developed in the lab.
2 hours of lecture, 3 hours of lab per week
[Course fee: $200]

ELT 2015 Introduction to Projects (1) **fall**
This course introduces the student to electrical product development and fabrication. Topics include introduction to schematic and circuit layout software and conventions; printed circuit board assembly; enclosures; connector and cabling options; and scheduling, budgeting, and documenting the project. Each student works on a common product of reasonable complexity; develops and assembles a printed circuit board; and documents and presents the finished product. The lab portion develops practical skills in circuit board layout and fabrication, time management, and technical presentation.
3 hours of lab per week Prerequisite: ELT 1110, 2041
[Course fee: $100]

ELT 2041 Electronic Circuits I (4) **spring**
This is an introductory course in electronic circuits that extends DC-AC circuits into active devices and their associated circuitry. Diodes; bipolar junction and field-effect transistors; and four-layer devices are studied. Topics also include the transistor as a small signal amplifier and as a switching element, op-amp circuits, and interfacing circuits common to computer applications.
3 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1031
[Course fee: $300] Corequisite: MAT 1312

ELT 2042 Electronic Circuits II (4) **spring**
This course is a continuation of ELT 2041 and addresses electronics from a system and applications view rather than a device view. System issues such as two-port networks, cascaded amplifiers, frequency response, Bode plots, and related topics are explored. Differential amplifiers; operational amplifiers; active filters; linear and switching power supplies; oscillators; and modulation are also covered.
3 hours of lecture, 3 hours of lab per week Prerequisite: ELT 2041; MAT 1520
[Course fee: $50]

ELT 2050 Microcomputer Techniques (4) **fall**
This course introduces the fundamentals of computers with an emphasis on applications using microcontrollers. Topics include assembly language programming; computer architecture (CPU, memory, input/output devices, and busses); counters; timers; parallel ports; A/D and D/A converters; and interfacing to switches, keypads, display devices, simple sensors, and DC motors.
3 hours of lecture, 3 hours of lab per week Prerequisite: CIS 2025 or 2262 or 2271; ELT 1110; ELT 2041 or 2072
[Course fee: $175]

ELT 2061 Electromechanical Systems I (4) **spring**
This course starts with an overview of control systems using block diagrams for description and analysis. Electronic operational amplifier circuits are introduced at an early stage due to their prevalence in conditioning transducer signals and as analog controller elements. Laplace transform techniques are used to predict both first and

second order system responses for the typical input functions. Steady state error and stability are examined. Algebraic prediction of closed loop responses is made. Bode Plot analysis in the frequency domain is used as an alternative method to the time domain response. PID Controller functions are covered. The programming is done using MATLAB; MATLAB with Simulink is required.
3 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1031, 2071; MAT 1520; PHY 1042
[Course fee: $50]

ELT 2071 Basic Electricity (3) fall
This course introduces the physical concepts of electricity and electrical devices. Fundamentals of power, resistance, inductance, capacitance, motors, and generators are covered from the standpoint of their relationship to mechanical applications.
2 hours of lecture, 3 hours of lab per week Prerequisite: MAT 1312
[Course fee: $90]

ELT 2072 Electronics (3) spring
In this course, discrete semiconductors, linear, and digital electronics are studied from the standpoint of the electrical-mechanical interface. Concepts of sensors and transducers, semiconductor control devices, and integrated logic circuits account for 80% of the course content. The remainder is focused on the application of PLCs using ladder logic.
2 hours of lecture, 3 hours of lab per week Prerequisite: ELT 2071; CIS 1050 or MEC 1050 or equivalent
[Course fee: $50]

ELT 2073 LabVIEW (3) as required
This course introduces the basics of the program and system design platform LabVIEW. The student develops and uses a series of VIs, test, and control systems within the LabVIEW environment. Advanced data analysis using the built-in program libraries is explored with results displayed on user-defined graphical readouts. myRIO required.
2 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1031 or 2071 or instructor permission
[Course fee: $50]

ELT 2075 Programmable Logic Controllers (3) spring
PLC design methodology, programming procedures, and practical system implementation topics are presented in an interactive lecture setting. The design principles discussed during lecture are reinforced with demonstrations and participative exercises.
3 hours of lecture per week Prerequisite: ELT 1031; MAT 1312

ELT 2130 Industrial Electronics (4) spring
This is a multi-purpose course designed to acquaint the student with the electronic devices, circuits, and computer techniques used to control industrial operations. Specifically included in the course are sensors and related instrumentation; power switching devices; DC and AC motors; stepping and brushless motors; and PLCs. Application and control issues involved with these devices are investigated with additional topics as time permits.
3 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1032, 2041; MAT 1520
[Course fee: $50] Corequisite: ELT 2042

ELT 2210 Introduction to Solid State Lighting (3) fall
This course introduces the fundamentals of solid state lighting systems. The student gains experience using various LEDs, optics, and heat sinks to create a total lighting solution. Various applications for using LEDs for lighting are studied.
2 hours of lecture, 2 hours of lab per week Pre-requisites: MAT 1312; PHY 1041 or 2041
[Course fee: $150]

ELT 2720 Electrical Project (2) spring
This course introduces the student to electrical product development and fabrication. Topics include schematic and circuit layout conventions; printed circuit board assembly; enclosures; connector and cabling options; and scheduling, budgeting, and documenting the project. Each student works on a product of reasonable complexity; develops and assembles a printed circuit board; and documents and presents the finished product.
1 hours of lecture, 3 hours of lab per week Prerequisite: ELT 1110, 2050
[Course fee: $200] Corequisite: ELT 2042, 2130

ELT 3010 Digital Circuits II (3) fall
This course extends the student's skill with digital hardware. It covers more advanced topics, including advanced digital design techniques. Various design methodologies are studied, such as state machine design and the use of hardware description languages. Applications focus on the design of computer hardware subsystems such as arithmetic logic units and memory. The labs illustrate the various methods for design entry such as schematic entry and VHDL, simulation, and testing. Designs are implemented using commercial PLDs. Basys 3 board is required.
2 hours of lecture, 2 hours of lab per week Prerequisite: ELT 1110
[Course fee: $50]

ELT 3040 Electronic & Data Communications (3.5) spring
This course introduces the student to the concepts necessary to understand data communications in today's

networked world. Both analog communications and digital communications are studied. Topics include media characteristics, Fourier series analysis, and frequency division multiplexing, noise, and modulation techniques. Additional topics include network protocols; data encoding techniques; error detection and correction; encryption; and data compression.
3 hours of lecture, 1.5 hours of lab per week — Prerequisite: CIS 2025; ELT 2050; MAT 1520
[Course fee: $50]

ELT 3050 Microprocessor Techniques II (4) **spring**
This course extends the student's skill with digital hardware. It covers more advanced topics including advanced digital design techniques. Various design methodologies are studied, such as state machine design and the use of hardware description languages. Applications focus on the design of computer hardware subsystems such as arithmetic logic units and memory. The labs illustrate the various methods for design entry such as schematic entry and VHDL, simulation, and. Designs are implemented using commercial Programmable Logic Devices (PLDs). Freedom board, car, LCD, and accessories are required.
3 hours of lecture, 3 hours of lab per week — Prerequisite: ELT 2050
[Course fee: $50]

ELT 3053 Electronics III (4) **fall**
This course builds on the introduction to solid state devices and analog systems in ELT 2041 and ELT 2042 and incorporates current devices and techniques in the industry. The course is divided into four main topics: power management (including buck and boost switching power supplies, switched capacitor, low-voltage power control circuitry, and drivers); noise, electromagnetic frequency spectrum, AM modulation, frequency modulation, and receivers; RF concepts and high-frequency behavior of passive components and transmission line concepts; and phase lock loop and frequency multipliers. MATLAB with Simulink is required.
3 hours of lecture, 3 hours of lab per week — Prerequisite: ELT 2042; PHY 1042
[Course fee: $50]

ELT 4010 Computer Architecture (3) **fall**
This course discusses the architecture of computer systems, both inside and outside the CPU. Topics include pipelines, cache, floating-point unit, RISC vs. CISC architecture, branch prediction, pipeline interlocks, and coordinating SMP machines. Additional topics cover the system at large (busses of various types, memory architecture, disk controllers, NICs, etc.) The emphasis is on real systems and characteristics of current technology.
3 hours of lecture per week — Prerequisite: ELT 3050

ELT 4020 Digital Signal Processing (3) **spring**
In this course, DSP theory and applications are covered from an introductory to an intermediate level. The implementation of DSP algorithms and mathematical functions such as IIR filters, FIR filters, correlation routines, DFTs, and IDFTs are examined. MATLAB with Simulink is required.
3 hours of lecture per week — Prerequisite: ELT 2050; MAT 2532

ELT 4701 Electrical Project I (2) **fall**
This course emphasizes project design, planning, and manufacturing issues. Topics include planning and budgeting; safety in the design; design for manufacturability; fabrication techniques; testing for safety and reliability; and quality control. The student is given a small electrical/electromechanical design on which to apply the lecture material. The student also selects and begins planning a major, team-oriented project with major software and electrical components that is completed in ELT 4702.
1 hour of lecture, 3 hours of lab per week — Prerequisite: Senior standing
[Course fee: $250] — Corequisite: ELM 4015, 4231

ELT 4702 Electrical Project II (3) **spring**
This course is a continuation of ELT 4701 and deals primarily with issues of large-scale projects. Coordination between members of design teams is stressed with frequent seminars and mini-presentations to communicate the design and team progress. A major presentation of a team project is required at the end of the semester.
1 hour of lecture, 6 hours of lab per week — Prerequisite: ELT 4701
[Course fee: $250] — Corequisite: ELM 4232; ELT 3040

Emergency Medical Services (EMS)

EMS 1020 The Art of Paramedicine (2) **fall**
This interactive course prepares the student to manage the human relations challenges encountered in their careers. Discussions encourage the student to broaden views and develop an awareness of the uniqueness of self and humankind. This course explores the finer aspects of communication, listening, assertiveness, and documentation. The paramedic student learns the importance of confidentiality; legal and ethical behavior; stress management; scene management; and the roles and responsibilities of the paramedic. Other topics covered include public health; workforce safety and wellness; the impaired provider; research in EMS; history of EMS; and EMS systems.
2 hours of lecture per week — Corequisite: EMS 1050

EMS 1030 Pharmacology & Medication Administration for the Prehospital Professional (3) **fall**
This course covers the concepts of pharmacology needed to understand and safely administer standard prehospital medications. Topics covered include pharmacokinetics, pharmacodynamics, medication administration,

drug dosage calculations, pharmacological terminology, drug legislation, drug references, toxicology, vascular access, and blood products.
3 hours of lecture per week Corequisite: BIO 2011; EMS 1050

EMS 1040 Airway Management for the Prehospital Professional (1) fall
This course prepares the student to manage adult, pediatric, and infant airways. Emphasis is placed on excellent Basic Life Support skills and progresses through the techniques of common prehospital Advanced Life Support airway skills. Scenarios and simulation are utilized prior to advancing to clinical and field opportunities to demonstrate ALS skills.
1 hour of lecture per week Corequisite: BIO 2011; EMS 1050

EMS 1050 Paramedic Principles & Practices I (2) fall
This interactive lab-based course assesses the student's Basic Life Support skills including BLS management, CPR, AED, and oxygen therapy. Medical Assessment and Trauma Assessment are taught at the ALS provider-level and the student is challenged with simulation and scenario-based activities to incorporate this new knowledge. Upon successful completion of the course, the student advances to the clinical setting (OR and ED). Paramedic lab kits are required. Pass/No Pass.
5 hours of lab per week Corequisite: EMS 1020, 1030, 1040
[Course fee: $100]

EMS 1210 Medical Emergencies for the Prehospital Professional (4) spring
This course covers the common medical complaints encountered by the paramedic. The student utilizes critical thinking skills to develop differential diagnoses and plans of care. Topics covered include respiratory, immunology, hematology, sepsis, endocrine, gastrointestinal, genitourinary, non-traumatic musculoskeletal disorders, allergic reactions, psychological, and neurological emergencies and conditions. Prior knowledge of anatomy and physiology and pharmacology is reinforced and enhanced. Includes Advanced Medical Life Support (AMLS). Classroom, simulation, and lab experiences prepare the student for clinical application of knowledge and skills.
4 hours of lecture per week Prerequisite: EMS 1801
Corequisite: BIO 2012; EMS 1240

EMS 1230 Cardiology for the Prehospital Professional (3) spring
During this intensive course, the student gains in-depth knowledge of cardiac electrophysiology; static and dynamic cardiac rhythm interpretation; arrhythmia management; and assessment and management of common prehospital cardiac-related problems. Includes 12-lead EKG interpretation; Acute Coronary Syndrome and ST Elevation Myocardial Infarction management; and Advanced Cardiac Life Support (ACLS). Lecture, scenarios, and simulation opportunities are included to enhance learning.
3 hours of lecture per week Prerequisite: EMS 1801
Corequisite: EMS 1240

EMS 1240 Paramedic Principles & Practices II (2) spring
This is the lab and clinical component of EMS 1210 and EMS 1230. The student is exposed to medical scenarios and simulations requiring paramedic-level assessments and interventions. Communication skills, teamwork, documentation, and transfer of theory into practice are evaluated in the lab setting. The student participates in clinical rotations in the ED, OR, ICU, maternity, pediatric, and psychiatric units. Paramedic lab kids and uniform are required. Pass/No Pass.
5 hours of lab per week
[Course fee: $100] Corequisite: EMS 1210, 1230

EMS 1290 Paramedic Clinical Time (Extended) (1) fall/spring/summer
The student who did not complete all of the clinical objectives in the 240 scheduled hours during the regular didactic portion of the program may schedule additional time through the college to complete the necessary objectives. Locations and times are on a case-by-case basis depending on what objectives still need to be achieved. Paramedic lab kids and uniform are required. Must be completed prior to the start of the next semester. Pass/No Pass.
Prerequisite: Completion of all didactic work

EMS 1310 Obstetrics, Gynecology, & Pediatrics for the Prehospital Professional (3) summer
During this course, the student learns to assess and manage gynecological and obstetrical emergencies and childbirth and to care for the pediatric patient from birth through age 18. The material includes topics of abuse and neglect, pediatric resuscitation, neonatal resuscitation, and technology-dependent children.
3 hours of lecture per week Prerequisite: EMS 1802
Corequisite: EMS 1350

EMS 1320 Trauma Management for the Prehospital Professional (3) summer
This course guides the student through the skills and knowledge needed to assess and manage a patient with traumatic injuries and shock. Topics covered include trauma systems; blunt force trauma; penetrating trauma; hemorrhage and shock; soft-tissue trauma; burn trauma; orthopedic trauma; thoracic trauma; abdominal trauma; head, face, neck, and spinal trauma; nervous system trauma; environmental trauma; and special considerations.
3 hours of lecture per week Corequisite: EMS 1350

EMS 1330 Emergency Medical Services Operations (2) **summer**
The student develops their role as an EMS leader in this course, learning about operations for ground and air ambulances; responding to Multiple-Casualty Incidents, Incident Management, and the Incident Command System; Special Rescue Operations, dealing with hazardous materials on emergency scenes; crime scene awareness; special considerations for rural EMS; and terrorism. Hazmat awareness, ICS, and NIMS are completed via distance learning.
2 hours of lecture per week Corequisite: EMS 1350

EMS 1340 Special Considerations for the Prehospital Professional (1) **summer**
During this highly interactive course, the student explores the challenges faced by prehospital professionals when dealing with geriatric, bariatric, and disabled clients. Normal differences seen based on age, size, and underlying medical problems are presented and the student is challenged to critically think about ways to overcome the barriers to providing the best care possible. Technology-dependent patients and the logistics of emergency calls versus transfers are discussed as well.
1 hour of lecture per week Corequisite: EMS 1350

EMS 1350 Paramedic Principles & Practices III (2) **summer**
This is the lab and clinical portion of EMS 1310, 1320, 1330, and 1340. The student is exposed to a variety of trauma, special circumstances, and EMS operations scenarios and simulations to enhance their ability to respond appropriately to similar situations in the field. During these 10 weeks, the student spends time in the OR; ICU; ED; Pediatrics; Labor and Delivery; and mental health. Pass/No Pass.
5 hours of lab per week
[Course fee: $100] Corequisite: EMS 1310, 1320, 1330, 1340

EMS 1801 Paramedic Field Experience I (1) **fall**
This first semester field experience transitions the student from the role of helper/BLS-provider to team leader. The student rides a total of 36 hours with a paramedic preceptor. The student incorporates the skills learned in first semester classes. The student must wear a Vermont Tech paramedic student uniform. Pass/No Pass.
36 hours of field experience per term Corequisite: BIO 2011; EMS 1020, 1030, 1040, 1050

EMS 1802 Paramedic Field Experience II (1) **spring**
In the second semester, the paramedic student demonstrates an expanded depth of skills and knowledge, including application of new information gained in EMS 1210 and EMS 1220. The student continues to work with a preceptor to meet the objectives, including providing safe and therapeutic care, effective communication, and demonstrating an understanding of the material covered in class. The student must wear a Vermont Tech paramedic student uniform. Pass/No Pass.
36 hours of field experience per term Corequisite: BIO 2012; EMS 1210, 1230

EMS 1803 Paramedic Field Experience III (1) **summer**
In the third semester, the student spends an additional 36 hours riding with their paramedic preceptor, learning how to act as team leader on calls and honing their professional communication skills. The student is assessed on their ability to perform the functional job description of a paramedic, as well as their ability to coordinate and manage a scene, the patient, and provide safe and effective care. The student must wear a Vermont Tech paramedic student uniform. Pass/No Pass.
36 hours of field experience per term Corequisite: EMS 1310, 1320, 1330, 1340, 1350

EMS 1804 Paramedic Field Internship (0) **fall/spring/summer**
The student who has successfully completed all of the didactic portions of the Vermont Tech Paramedicine program may enroll in EMS 1804. During this immersion experience, the student acts as a paramedic under the supervision of a preceptor and acts as the team leader: managing the scene, patient, and crew. This session is a minimum of 240 hours. Time is extended as needed to meet the objectives of the internship portion. The student is assessed on their ability to perform the functional job description of a paramedic, as well as their ability to coordinate and manage a scene, the patient, and provide safe and effective care. This course must be completed prior to the start of the next semester. The student must wear a Vermont Tech paramedic student uniform. Pass/No Pass.
Minimum of 240 hours, maximum of 1 year drive time Prerequisite: Completion of all didactic work

English (ENG)

ENG 1042 Introduction to College English (3) **fall/spring**
In this course, the student develops their reading skills by analyzing examples of professional writing and develop their writing skills in internal writing and at least five essays. The student reviews principles of grammar and sentence construction and is introduced to rhetorical strategies. Emphasis is placed on the process of revision through class editing of essays. Word processing and computer network skills are taught in the lab.
3 hours of lecture, 1 hour of lab per week Prerequisite: Placement level 1

ENG 1060 Freshman Composition (3) **fall/spring**
In this course, the student thinks and reads critically, writes effectively, and understands the fundamentals of literary analysis and written composition. Classroom discussion of assigned readings and the construction of related essays are stressed. A required research paper demonstrates the student's use of appropriate research materials in terms of locating, organizing, and presenting materials in standard MLA format. The writing gradua-

tion standard and information literacy standard are assessed in this course.
3 hours of lecture per week | Prerequisite: Placement level 2

ENG 1061 English Composition **(3)** **fall**
In this course, the student reads and thinks critically, writes effectively, and understands the fundamentals of literary analysis and written composition. Classroom discussion of assigned readings and the construction of related essays are stressed. A required research paper demonstrates the student's use of resources in locating, organizing, and presenting materials in an accepted format. The writing graduation standard and information literacy standard are assessed in this course. This course is writing-intensive.
3 hours of lecture per week | Prerequisite: Placement level 3 or higher

ENG 2080 Technical Communication (3) **fall/spring/summer**
This course is a comprehensive study of the principles, methods, and forms needed to produce clear and effective communications and technical reports, both written and oral. The course stresses business correspondence and the use of graphics in documents and oral presentations. A major technical report is also required and is used for assessment of the VTC writing graduation standard.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2101 Introduction to Creative Writing **(3)** **as required**
This course encourages the student to explore the self and the world around them with a writer's eye. Along with writing their own stories, the student reads stories and essays by other writers and students workshop each other's stories. This course is writing-intensive.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2105 Creative Nonfiction **(3)** **as required**
The course introduces fundamental techniques of writing creative nonfiction, including examining point of view and use of time, place, details, and language. The student refines their writing skills through attention to the craft of writing, revision, and the reading of models. This course is writing-intensive.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2130 Writing Poetry (3) **as required**
This course explores the art and the craft of writing poetry and offers an opportunity to practice concepts learned in class in a variety of written exercises. While the instruction encourages the student to study published poetry, the emphasis is on writing poetry for an audience of poetry readers. The course also covers the rudiments of narrative structure. No previous writing experience is required.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2320 Themes in American Literature (3) **as required**
In this course, the student reads and discusses selected works of recent and earlier American literature focusing on themes such as growing up American, the immigrant experience, country life vs. city life, alienation, the pioneer experience, the impact of the western hero, and work ethic. Understanding and appreciation of the uniqueness and continuity of these themes and of the methods used by fiction writers enhance the student's reading experience.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2485 Literature of Peace & Pacifism (3) **as required**
This course introduces the student to the themes of peace, pacifism, and nonviolence in literature from the United States and around the world. The student reads and discusses classic and contemporary novels, short stories, poems, and films that respond critically to war and suggest peaceful alternatives.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 2590 Stephen King In Literature & Film (3) **as required**
This course offers a critical inquiry into the films, novels, life, and works of the bestselling and most popular author of our time: Stephen King. Through the critical analysis of such films as *Carrie*, *Stand by Me*, *Misery*, *The Shining*, and *Storm of the Century*, the student explores their personal relationship to horror fiction while entertaining a central, pivotal question: what does horror manifestation in popular culture reveal about the American psyche? This course seeks to unravel our cultural fascination with themes of horror fiction while exploring King's works as both a continuation of the literary Gothic canon and a driving force in the cinematic tradition of American horror films.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 3126 Science Fiction Lit: Utopias, Dystopias, & Ecotopias (3) **as required**
This course introduces the student to utopian, dystopian, and ecotopian visions in science fiction literature. Course work includes reading and discussing novels and short stories and watching films that address the theme of sustainable futures or apocalypse.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

ENG 3485 The Tradition of Anti-War Literature (3) **as required**
This course studies the tradition of anti-war literature from the United States and around the world. The student reads and discusses classic and contemporary novels, short stories, poems, and films which address themes of peace, pacifism, and nonviolence, responding critically to war and suggesting peaceful alternatives.

3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

ENG 3490 Memoir: Telling Your Life Story (3) **as required**
This course teaches the student to discover the natural form and content of their life stories from a writer's perspective. The student practices the four steps of the writer's craft: observation, expression, reflection, and wordsmithing. They read memoir excerpts from classical and contemporary writers, studying different styles and forms of storytelling. Students workshop each others' stories, practicing the necessary art of revision, which is the most essential and most difficult part of creative writing. The student has the opportunity to perform their stories in a public reading; publishing in print and electronic media is also covered. This class is writing-intensive.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

ENG 3590 The Films & Novels of Stephen King (3) **as required**
This advanced writing course offers a deeper and more in-depth focus than ENG 2590 with the same goals.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

Equine Studies (EQS)

EQS 1010 Introduction to Equine Studies I (4) **fall**
The student is introduced to the history of the horse, the equine industry, and basic stable management principles. The course combines theory and practice by providing daily horse care and stable maintenance as needed under supervision. Lecture topics include history of the horse; the horse industry and careers; structure and anatomy; regular health assessment; first aid; bandaging; use of restraints; safe handling practices; deworming schedules; clipping; and basic hoof care.
3 hours of lecture, 2 hours of lab per week
[Course fee: $50]

EQS 1012 Introduction to Equine Studies II (2) **spring**
This course introduces the student to Vermont Tech and provides an overview of the Equine Studies major. Topics to be covered include the equine industry in the US; equine safety and ethics; the equine in human history; equine psychology; fundamentals of equine behavior and training; breeds and conformation; disciplines; equine management; and career options in the equine industry.
2 hours of lecture per week
[Course fee: $50]

EQS 1032 Stable Management (3) **spring**
In this course, the student builds upon their study of stable management principles from EQS 1031 and continues to be responsible for daily horse care under supervision. Lecture topics include insurance; contracts; facilities; arena footing; fencing and pasture management and rotation; basic feeding principles; fire safety; manure management; and trailering.
2 hours of lecture, 2 hours of lab per week
[Course fee: $50]

EQS 1220 Horse Judging (1) **fall**
This course introduces the analysis of conformation, movement, and function as well as the theory and practice of horse and horse show judging. The course prepares the student to participate on the Vermont Tech horse judging team and/or pursue certifications in judging.
3.5 hours of instruction per month

EQS 2011 Equine Training I (3) **fall**
In this course, the student learns safe and effective techniques for training the green or unbroken horse for various disciplines and develops skills to critically analyze various trainers and strategies. The student views and evaluates equine behavior and the training methods of professional trainers. The labs include hands-on practice in groundwork, including round-penning, classical lunging, and long-lining with a strong emphasis on safety and developing a positive attitude in the horse. The training horses are introduced to harness and/or saddle as well as desensitization training.
2 hours of lecture, 2 hours of lab per week
[Course fee: $150]

EQS 2020 Equine Lameness (3) **fall**
This course teaches the student to recognize lameness and gait abnormalities in the horse. They learn how to evaluate lameness using physical examination, palpation, and gait evaluation and are exposed to veterinary diagnostic methods. They also learn treatments for common skeletal, muscular, neurological, and hoof-related issues. The main goal is for the student to become well-educated horsemen who can recognize lameness, handle a horse appropriately, and make educated decisions about treatment options.
2 hour of lecture, 2 hours of lab per week Prerequisite: EQS 1031,1032; VET 1020
[Course fee: $150]

EQS 2025 Equitation (1) **fall/spring**
Emphasis in each course section is placed on assisting the student's development at their own pace and introducing a variety of riding and driving methods. The student learns about correct use of tack for various disciplines or purposes as well as correct technique in their choice of dressage, jumping, hunt seat equitation, stock seat/

western, or driving. Not all topics are covered in each course, but all topics are addressed within the sequence, which each student must complete in the correct order. All students are encouraged to take at least one semester of dressage, driving, and western horsemanship. This course is repeatable for credit. Pass/No Pass.
2 hours of activity per week
[Course fee: $550]

EQS 2041 Equine Massage I (3) **fall**
This course introduces the theory and practice of equine massage. It includes an intensive study of equine anatomy including muscular and skeletal structures. The focus is on identifying soreness and other problems affecting the equine athlete, developing strategies for addressing the problems, and applying therapeutic massage to improve the horse's mobility, range of motion, and general well-being.
2 hours of lecture, 2 hours of lab per week Prerequisite: VET 1020 or instructor permission
[Course fee: $50]

EQS 2801 EQS Internship (0) **summer**
In this internship experience, the student participates in an internship of their own choosing and coordinates with the Program Director about the terms of the internship, including number of hours and responsibilities. The student keeps a daily log of hours and activities in addition to completing other required documents. Pass/No Pass.
45 hours minimum per term Prerequisite: Completion of freshman EQS courses

EQS 2802 EQS Internship Review (1) **fall**
This is the review portion of EQS 2801. Pass/No Pass.
[Course fee: $250] Prerequisite: EQS 2801

EQS 3012 Equine Training II (3) **fall**
This course focuses on refining green-broke and trained horses. Attention is given to producing lightness; correcting head and body position; using the horse's body correctly; achieving balanced and correct gaits; and developing smooth transitions.
2 hours of lecture, 2 hours of lab per week Prerequisite: EQS 2011 with a *C* or better
[Course fee: $150]

EQS 3031 Riding Instruction I (3) **fall**
This course exposes the student to the standards of three equitation seats: dressage, western, and hunt seat. The student participates in detailed analysis of human and equine biomechanics; organization and planning of lessons; and implementation of skills and techniques common to all disciplines as well as hands-on problem-solving of biomechanical problems.
2 hours of lecture, 2 hours of lab per week
[Course fee: $150]

EQS 3032 Riding Instruction II (3) **spring**
This course focuses on the processes of learning and teaching, the way that people process information, and the elements necessary for excellent instruction. The course incorporates knowledge of human and equine biomechanics from EQS 3031 using communication skills; evaluating and working with different learning modalities; and the analysis, organization, and planning of lessons.
2 hours of lecture, 2 hours of lab per week Prerequisite: EQS 3031
[Course fee: $150]

EQS 3042 Equine Massage II (3) **spring**
This course continues to build upon the foundations established in EQS 2041 with increased attention to muscle and other tissue loosening and alignment to improve equine movement, performance, and comfort. Topics include massage practices, stretching, saddle fit (English and western), and conformation evaluation. Lab sessions provide increasing responsibility for determining areas of concern, developing plans for improvement, and implementing and assessing such measures.
2 hours of lecture, 2 hours of lab per week Prerequisite: EQS 2041
[Course fee: $50]

EQS 4110 Equine Health & Diseases (3) **spring**
This course provides an in-depth exploration of issues relating to equine health management, including signs of health and illness; diseases and their causes; preventive and maintenance care measures; and emergency care for horses.
2 hours of lecture, 2 hours of lab per week Prerequisite: AGR 2030; VET 1020
[Course fee: $50]

EQS 4610 Equine Studies Senior Seminar (2) **spring**
In this capstone course, the student proposes, gains approval for, and completes a research project on a specific area of the equine industry. The project includes a hands-on component and concludes with a substantive written report and an oral presentation. Classes include employment search strategies, guest speakers from various areas of the equine industry, and discussions of current issues within the industry.
2 hours of lecture per week Prerequisite: Sophomore standing
[Course fee: $50]

Fire Science (FSC)

FSC 1010 Principles of Building Construction & Fire Protection (3) **fall**
This course provides the components of building construction that relate to fire and life safety and how understanding building types and construction principles improves fire suppression and fire ground safety. The emphasis of this course is on firefighter safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, pre-planning fire operations, and operating at emergencies.
3 hours of lecture per week

FSC 1021 Firefighting Services I (6) **fall**
This introductory course provides an overview of fire services; career opportunities in firefighting and related fields; philosophy and history of fire protection/service; fire loss analysis; organization and function of public and private firefighting services; fire departments as part of local government; laws and regulations affecting the fire service; introduction to fire protection systems; and understanding fire strategy and tactics. The student learns basic fire suppression, rescue, and extrication skills. This academic course includes competency-based skill development necessary to perform fire/rescue duties and is part one of a two-part course leading to Vermont certification as a Firefighter I & II. This certification is through the Vermont Fire Academy and is subject to their schedule.
4 hours of lecture, 2 hours of lab per week, some weekend training required
[Course fee: $200]

FSC 1022 Firefighting Services II (4) **spring**
This course continues the study of fire service nomenclature; specific firefighting techniques and functions; basic fire chemistry and physics; fire protection systems; and understanding fire strategy and tactics. The student learns and practices basic fire suppression, rescue, and extrication skills. Upon successful completion of this course, the student is eligible to apply for Vermont certification as a Firefighter I & II. This procedure includes passing a written exam, proficiency skill-based testing, and participation in a live burn exercise at a Vermont Fire Academy training site. This certification is through the Vermont Fire Academy and is subject to their schedule.
4 hours of lecture per week, some weekend training required Prerequisite: FSC 1021

FSC 1030 History & Impact of Fire in America (3) **fall**
This course provides an overview of the history and impact of fire in American society. Course material includes a general understanding of fire and combustion; the history of fire fighting in the US; analysis of significant fires in American history and their impact; discussion of the catastrophic theory of management as it pertained to these fires; today's impact of the urban wildfire interface; and how fire affects society and the family unit.
3 hours of lecture per week

FSC 1220 Fire Service Leadership (3) **spring**
This course develops a foundation of leadership skills for the firefighter/officer. Course content includes the identification of leadership styles, group dynamics, diversity, conflict resolution, managing change, and problem solving. This course emphasizes personal leadership development and supervisory skills using applied research, readings, group exercises, and classroom discussion.
3 hours of lecture per week

FSC 2020 Fire Service Hydraulics & Water Supply (3) **spring**
This course provides a foundation of theoretical and mathematical knowledge to understand the principles of fluids and the use of water in fire protection and to apply hydraulic principles and formulas to analyze, plan, and solve water supply problems. Fire ground applications include pump operations, hose lines, nozzle pressures and providing adequate water supply for fire suppression, tanker shuttles, and large diameter hose.
3 hours of lecture per week Prerequisite: MAT 1210

FSC 2210 Fire Administration (3) **spring**
This course introduces the student to the organization and management of a fire department and the relationship of government agencies to the fire service. Development of fire service leadership traits are viewed from the perspective of the chief officer. Classroom content includes grant writing; extensive budget development and a budget presentation project; public presentation skills; and analysis of the fire department as a business.
3 hours of lecture per week

FSC 2220 Firefighting Strategy & Tactics (3) **fall**
This course provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment, and extinguishing agents on the fire ground. The student makes and documents decisions based on computer generated scenarios. This course is a capstone course in the Fire Science program, drawing on knowledge and understanding of fire dynamics obtained in other courses.
3 hours of lecture per week Prerequisite: Department permission for non-FSC majors

FSC 2230 Chemistry of Hazardous Materials (3) **spring**
This course provides basic fire chemistry relating to the categories of hazardous materials including problems of recognition, reactivity, and the health hazards encountered by firefighters. It also prepares the student to determine an initial course of action for emergency responders and understand strategies, tactics, and resource management techniques for handling hazardous materials incidents.
3 hours of lecture per week Prerequisite: CHE 1020

FSC 2240 Fire Protection Systems (3) **spring**
This course focuses on the features of the design and operation of fire alarm systems; water-based and special hazard fire suppression systems; and water supply. Classroom activities involve the use of fire extinguishers, wet/dry/residential sprinkler systems, and alarm notification systems.
3 hours of lecture per week

FSC 2250 Fire & Life Safety Educator (3) **fall**
This course focuses on the history and philosophy of fire prevention; organization and operation of a fire prevention bureau; use of fire codes; identification and correction of fire hazards; use of the NFIRS system; and the relationships of fire prevention with built-in fire protection systems, fire investigation, and fire and life-safety education in community schools. The student prepares presentations, conducts a safety day community program, and studies the effects of tragic fires which led to new fire safety standards.
3 hours of lecture per week

FSC 2260 Career Wellness: CPAT Prep (3) **spring**
This course provides the student with information regarding health and wellness related to the field of public safety. The knowledge gained through this class serves as a foundation for mental and physical fitness with the goal of preparation for the Candidate Physical Agility Test (CPAT). While some of the topics in this class are specific to firefighting, ties can be drawn between all sectors of public safety.
3 hours of lecture per week

FSC 2820 FSC Internship (3) **as required**
This internship is meant to provide an employment experience with one of several career fire departments or other emergency service organizations in Vermont or out-of-state.
Prerequisite: FSC 1021; VFA Pro-Board FF I certification

Ground Transportation Services (GTS)

GTS 1040 Vehicle Electrical Systems (3) **spring**
This course gives the student a thorough understanding of electrical systems and teaches diagnostic and troubleshooting skills. Topics include the operation and testing of storage batteries, starting systems, charging systems, ignition systems, and basic accessory systems. The student becomes familiar with various types of test equipment, diagnostic charts, and vehicle wiring schematics.
3 hours of lecture per week Corequisite: ATT 1110 or DSL 1070
[Course fee: $50]

GTS 1120 Vehicle Electronics (3) **fall**
This course introduces the student to general vehicle electrical and electronic principles, theory, and components. Topics include Ohm's law, circuit analysis, basic circuits, diodes, transistors, relays, and solenoids.
3 hours of lecture per week Corequisite: ATT 1090 or DSL 1030
[Course fee: $75]

History (HIS)

***HIS 1111 World History I* (3)** **as required**
This course introduces the world's major civilizations: Ancient Mediterranean, European, South Asian, East Asian, African, Islamic, and Mesoamerican from their origins to the time of the global expansion of European civilization.
3 hours of lecture per week

***HIS 1112 World History II* (3)** **as required**
This course is a continuation of HIS 1111 with particular attention given to the problems and challenges of globalization.
3 hours of lecture per week

***HIS 1211 American History I* (3)** **as required**
This is a survey of the major events in American history from pre-colonial days to the time of the Civil War and Reconstruction. The student examines forces behind these events and their social, cultural, economic, and political implications for the American people and the new nation.
3 hours of lecture per week

***HIS 1212 American History II* (3)** **as required**
This is a survey of the major events in American history from Reconstruction to the present, with an emphasis on understanding the social, cultural, economic, and political factors in the emergence of the United States as a dominant world power.
3 hours of lecture per week

***HIS 1220 Native American Histories & Culture* (3)** **as required**
This is an interdisciplinary course exploring indigenous cultures of North America. The student considers the pre-Columbian world; history of contacts between natives and settlers; and contemporary issues including legal sovereignty, land claim, resource policy, poverty, and cultural autonomy.
3 hours of lecture per week

HIS 1260 Information Technology: Past, Present, & Future (3) **fall**
This course covers the history of computing from early mechanical devices; theoretical milestones; electronic computers of the late 1940s and 1950s; generational changes in architecture; underlying technologies; the progression from main frames to minicomputers, supercomputers, microcomputers, and embedded computers; and networking. Introductory societal and/or ethical issues, such as the digital divide, encryption, peer-to-peer file sharing, and computers and homeland security are also covered. Further focus is placed on organizational and human forces shaping the adoption of information technology and the difficulties that may be experienced during a systems implementation, a change of systems, and the impacts of computer technology on employment, health, and the community. It concludes with various trends and forces shaping information technology and probable changes that will occur from a futurist perspective. Topics include recent new technologies and their effect on people and society; basic concepts of future studies; and the application of future studies to make a prediction regarding new technologies.
3 hours of lecture per week

HIS 2150 History of the US in the Sixties **(3)** **as required**
This course explores the movements and events of the US during one of the most tumultuous decades: the 1960s. Through documentary films and other media, readings, websites, and discussion, the student studies such topics as the civil rights movement, assassination, the student movement, the impact of the Vietnam War, and the music, art, and literature that are the hallmarks of a decade marked by social activism and political and cultural upheaval. Through individual and group reading, study, and presentation, the student learns of the continuation of the environmental, women's, and civil rights movements.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HIS 2270 Society & Environment in History **(3)** **as required**
This course provides an exploration of the response to environmental challenges by various societies in history and why societies fail and perish or succeed and survive.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HIS 3056 Race in America **(3)** **as required**
This course uses a multidisciplinary lens to analyze American racial attitudes and beliefs over time. The course emphasizes the historical roots of American racism and how the racial perceptions of various types of Americans have evolved as material circumstances and ideological traditions changed. Both progressive and regressive racial attitudes are addressed through readings, lectures, discussion, and guest speakers. The student explores how racial attitudes have interacted with culture, politics, work, gender relations, violence, religion, and ethnicity to profoundly shape twenty-first century America.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HIS 3130 The Civil War & Reconstruction **(3)** **as required**
The era of the Civil War and Reconstruction represents one of the most important periods in US history. Four million African Americans gained freedom from bondage, 600,000 soldiers perished in the nation's bloodiest war, and the 13th, 14th, and 15th amendments to the constitution redefined the nature of American citizenship. This upper-division course explores the war and its aftermath by discussing the period's most important themes, reading the works of distinguished authors, and examining documents left by participants. Topics for consideration include the ebb and flow of military campaigns; the northern and southern home fronts; the politics of war and peace; and the impact of the war on black and white Americans in the North and South.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HIS 3165 Vermont History **(3)** **as required**
This course introduces the student to the major historical themes and questions that have shaped the state of Vermont over time and provides a close look at Vermont's historical, social, and economic development; its problems as a republic; the struggle for statehood; and its constitution and government today. The instruction observes Vermont's place in American civilization from its inventive, cultural, educational, literary, and political contributions.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

Humanities (HUM)

HUM 2020 Bioethics **(3)** **as required**
This course explores ethical issues and decision-making processes involved in biomedical research and practice as viewed from legal, medical, social, and philosophical perspectives. The student applies philosophical frameworks, theoretical approaches, argument development skills, and critical thinking to address moral questions pertaining to the beginning and end of life; biotechnology and genetic experimentation; justice in healthcare; responsibilities of physicians; environmental health; and other pertinent subjects.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HUM 2040 The Holocaust **(3)** **as required**
This course is an exploration of the Holocaust from historical, political, moral, and religious perspectives. The student uses historical documents, film, literature, and art to explore various dimensions of this watershed event in Western civilization.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HUM 2070 The Vampire in Literature, Culture, & Film **(3)** **as required**
The image of the vampire has long held sway with popular imagination. Since the publication of Bram Stoker's *Dracula* in 1897, the vampire has become a staple of popular culture, appearing in literature, advertisements, cartoons, music, television shows, and film. This course examines the role of the vampire in literature, culture, and film. Through the reading of texts and the viewing of films, the student understands the fundamental aspects of Gothic literature and formulates their own ideas as to the importance of the vampire archetype. In addition, the student learns to identify vampirical elements in literature and film and enhance their knowledge and understanding of the vampire's role in popular culture. This class is writing-intensive.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 2080 The Literature & Culture of Witchcraft (3) **as required**
Grounded in the early European historical context and the colonial American experience of witchcraft, this course engages the student in an exploratory and critical dialog that examines witchcraft as it is represented in various types of literature (including plays, short stories, poetry, court documents, journal entries, and novels), culture, and film. Witchcraft stereotypes and hysteria often represent the societal anxieties and beliefs of the culture in which they appear and offer a rich subject for academic study. By drawing from the readings and films assigned throughout the semester, as well as personal research and reflective and critical analysis, the student develops their own unique discourse with regard to the literature and culture of witchcraft and its unique contribution to contemporary and past culture. This class is writing-intensive.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 2160 Humor in Literature, Film, & Writing (3) **as required**
In this course, the student first examines how humor works in literature and film and then uses these tools in their own creative writing. The art of writing with style and of perfecting a singular voice for humorous purposes (including social, political, and persuasive) is taught through critical analysis of successful comedic literature and film, everything from *Lysistrata* to *Annie Hall*. The student mixes rhetorical strategies with comedic devices by writing stories, rants, parodies, reviews, and dramatic dialogue. Culminating projects include assembling a course portfolio of creative work and writing a longer analytical essay. This course is writing-intensive.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 2170 The Culture of Sustainability (3) **as required**
In this course, the student reads and discusses the literature and philosophy of sustainability, simplicity, and deep ecology and considers more mindful approaches to sustainability in our lives.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3025 Myth: The Ties That Blend & Bind (3) **as required**
This course encourages the student to explore a variety of myths from ancient cultures with special attention to their influence on and reflection of social beliefs and structures. The course highlights the common elements shared by all mythic structures as a means of examining the global human experience and search for meaning throughout the ages. This course is writing-intensive.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3050 Theories of Science & Technology (3) **as required**
This course explores a variety of historical and philosophical perspectives on science and technology. Special emphasis is placed on the relationships of science; technology; social and political structures; and individual responsibility. Topics include the nature of science and technology; elitism in science and technology; goals and control; and the role of the individual scientist or technician.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3060 Cyberethics (3) **as required**
This course introduces the student to fundamentals of ethical inquiry and the ethical implications of current computing technologies and applications.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3070 The Vampire in Literature, Culture, & Film (3) **as required**
This advanced writing course offers a deeper and more in-depth focus than HUM 2070 with the same goals.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3210 Folklore, Literature, & Legends of New England (3) **as required**
Grounded in academic theory and focusing on the literature, folklore, and legends of New England, this course explores broad issues of representation, cultural, social, and political issues and the shaping of a uniquely New England culture and people. Through the study of folklore in its various forms; classic and contemporary literature by New England authors; and oral legends, the student gains a broader understanding of New England, its history and culture and of their own role in shaping the culture and world in which they live. This class includes a field trip designed to immerse the student in the living history of New England and is writing-intensive.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

HUM 3490 Crime & Punishment in Film & Literature (3) **as required**
This course introduces the student to the fundamental legal and ethical issues in American crime and criminal justice through film and literature. The course examines the dilemmas in crime and punishment. The student discusses literature and films in the context of the humanities.
3 hours of lecture per week Prerequisite: ENG 1061 or equivalent

HUM 4010 East & West Holistic Healing (3) **as required**
This course introduces the student to holistic healing; complementary and alternative therapies; energy and elemental work; multicultural perspectives; and traditional healers. The student understands, evaluates, and appreciates traditional holistic models of health and healing, as well as complementary and alternative therapies, and learns and applies at least one chosen modality in their healing work.
3 hours of online instruction per week Prerequisite: ENG 1061 or equivalent

Interdisciplinary (INT)

INT 0010 Effective Learning (2) **fall/spring**
This course introduces the student to the behaviors and skills necessary for academic success. Through a series of readings, journals, lectures, and essays, the student develops skills in setting goals; developing a sense of personal ownership and responsibility; and developing self-awareness, along with the more mechanical skills of note-taking and organization. Particularly appropriate for the student on academic probation, the learning acquired enables them to achieve and maintain good academic standing. Credits do not count toward graduation.
2 hours of lecture per week

INT 1005 Self, Career, & Culture (3) **spring**
This is an interdisciplinary course designed for freshman that investigates the relationships between individuals, their careers, and the social environments in which they live. This course explores the interactions between Self and Society and helps to explain the nature of the individual as a student; the nature and impact of the student’s program on society; the relationship among educational disciplines and society; the role of the individual and the student’s career in society; and the responsibilities of citizenship.
3 hours of lecture per week

INT 1021 Creativity & Innovation (3) **fall**
This course is a foundation course in the Entrepreneurship major. The student learns techniques for improving the flexibility and originality of their thinking and explores approaches used by managers and organizations to create and sustain high levels of innovation. Topics include personal thinking preferences; everyday creativity and eliminating mental blocks; creative thinking techniques; idea selection approaches; teaming techniques for creativity; conditions that promote creativity; design for interaction; disruptive technologies; and intellectual property. The course uses fun hands-on activities to stimulate innovation.
3 hours of lecture per week

INT 2660 Class & Educational Success (3) **fall**
In this course, framed by the work of Ruby Payne, the student develops an understanding of the dynamics of poverty, particularly generational poverty, and the economic class systems in work and school environments. The student explores the history of Lyndon Johnson’s “War on Poverty” and the TRiO programs developed at that time by the federal government to alleviate the challenges poverty poses for the student attempting to obtain higher education. The student learns and has the opportunity to discuss how these theories relate to their own experience. Finally, each student has the opportunity to practice the skills needed to effectively communicate and work with people from a wide variety of backgrounds to be effective in today’s workforce.
3 hours of lecture per week Prerequisite: ENG 1060 or equivalent; GPA > 2.5 in previous semester; instructor permission

INT 3060 Leadership Studies (3) **as required**
This course delivers a diverse, interdisciplinary approach to leadership instruction. Grounded in the humanities, the curriculum is relevant to the modern age. The curriculum combines the study of great leaders portrayed in the humanities by writers, historians, and film-makers from ancient times to modern-day: a novel and experiential learning approach to defining and rediscovering leadership qualities.
3 hours of lecture per week

Landscape (LAH)

LAH 1020 Introduction to Horticulture (3) **fall**
This survey course introduces the principles and practical applications of horticulture. The student becomes familiar with the basic science that forms the foundation of horticulture and uses this information to understand how horticulture is applied. Topics include plant classification; plant structures; plant physiology and development; plant environments; plant propagation; harvesting and post-harvest preservation; and crop improvement.
3 hours of lecture per week

LAH 1021 Landscape Graphics (3) **fall**
The purpose of this course is to familiarize the student with a broad range of graphic techniques as well as the specific tools necessary for each. Specific coursework includes freehand drawing; an introduction to mechanical/technical drawing; the conventions of landscape/architectural drawing, including its intentions, capabilities,

and use; three-dimensional drawing techniques; tonal value and texture rendition; various media and their specific uses; lettering; and color rendition for presentation drawings.
6 hours of studio per week
[Course fee: $20]

LAH 1030 Woody Ornamentals (3) **fall**
This course covers the identification of approximately 90-120 native and cultivated woody plants found in northern New England. In addition, the course addresses plant nomenclature; plant characteristics and requirements (environmental, cultural, and design/ornamental); plant associations; plant selection; and horticultural and planting design issues. Offered every other year.
2 hours of lecture, 3 hours of lab per week

LAH 1031 CAD for Landscape Applications (2) **spring**
This course introduces the use of computer-aided drafting (CAD) as a drafting, documentation, production, and presentation tool for landscape design. The student becomes familiar with a variety of software applications such as Photoshop, InDesign, Illustrator, and SketchUp. Specific coursework covers topics such as photo overlay; manipulation; layout; file management; image management and interpretation; composition; and presentation drawings. All work builds upon foundational understanding of digital files, organizational systems, and protocols.
3 hours of studio per week Prerequisite: LAH 1021 or instructor permission

LAH 1040 Greenhouse Management (3) **spring**
This course covers the fundamentals of commercial greenhouse production. Control of the greenhouse environment and the effects that this has on plant growth are stressed. The student learns about greenhouse construction; heating and cooling; growing media; fertilization; watering; pest control; and the production of container-grown crops. Laboratory exercises are conducted in the greenhouse or at the facilities of local growers.
2 hours of lecture, 3 hours of lab per week

LAH 1050 Introduction to Soils (4) **spring**
This course covers soil formation and classification and the ways in which chemical, physical, and biological properties of soil affect plant growth. It also examines issues related to soil temperature, aeration, organic matter, and tilth. Practices best suited to erosion control and nutrient management are explored. The student learns about soil testing and the most effective liming and fertilizing practices for sustainable management. The college, home gardens, and local farms are used in soil and fertilizer analysis.
3 hours of lecture, 2 hours of lab per week

LAH 2010 Landscape Construction Practices (3) **fall**
This course introduces the materials and methods of landscape construction and management. Emphasis is placed on how general intentions are developed at the plan and detail level, resolved through sound principles of construction, and professionally documented according to conventional standards. Specific coursework includes surveying; map-making; construction of freestanding retaining walls; construction of patios and walkways; grading earthworks; and the principles of statics and mechanics as they apply to landscape design. Theory and practice are emphasized equally.
6 hours of studio per week Prerequisite: LAH 1021, 2011
[Course fee: $20] Corequisite: LAH 1050

LAH 2011 Introduction to Landscape Design (3) **spring**
This course introduces the student to the basic principles of landscape design in order to build a fundamental knowledge of and fluency in the issues and language of landscape design and its application. The coursework is based on a progression of basic design principles that build to an increasingly sophisticated understanding of design and its application, with a strong emphasis on the interrelatedness of architectural built form and landscape built form. Throughout the course, verbal and graphic communication of ideas and solutions are emphasized. Individual design projects are developed under faculty supervision and are then presented to a jury of faculty and distinguished practitioners. Additionally, the student receives an overview of landscape architectural history and is exposed to the work of practitioners in the field.
6 hours of studio per week Prerequisite: ARE 1210 or CPM 1021 or LAH 1021
[Course fee: $20]

LAH 2012 Landscape Design II: Planting Design (3) **spring**
This course focuses on the art and science of planting design with essential emphasis given to theory and practice (site analysis; design process and synthesis; development of an appropriate plant palette; production of planting plans; specifications and contract documents; and cost estimating and bid documents). The student develops appropriate plant palettes that are responsive to site characteristics, cultural requirements of individual plant species, aesthetic qualities of individual plant species, and design intent. Assignments focus on design principles and elements in planting designs, historical precedent, and current issues relevant to planting design. Attention is given to observation, assessment, and the practice of designing as a method of gaining knowledge about the theory and practice of planting design. Content is delivered through lectures, readings, group discussions, field trips, studio/design projects, and juried presentations.
6 hours of studio per week Prerequisite: LAH 2011
[Course fee: $20]

LAH 2020 Plant Propagation (3) **fall**
The student in this course studies the principles that explain and control plant propagation and practices propagation techniques in the lab. Propagation by seeds, cuttings, grafting, layering, and other common methods is explored. Emphasis is placed on the newest technologies, including tissue culture.
2 hours of lecture, 3 hours of lab per week Prerequisite: LAH 1020 or instructor permission
[Course fee: $10]

LAH 2030 Herbaceous Plant Materials (3) **fall**
This course familiarizes the student with 100-150 herbaceous plants including perennials, annuals, biennials, bulbs, and turfgrass. Emphasis is placed on identification; aesthetic and functional use in the landscape; plant culture and maintenance; transplanting; and plant design and composition. Offered every other year.
2 hours of lecture, 3 hours of lab per week

LAH 2801 LDSH Summer Internship (0) **summer**
After successful completion of the first year core curriculum, the student is required to experience horticulture or design in an employment setting. With the aid of program faculty and staff, the student arranges a summer job/practicum that broadens their understanding of real world horticulture and design. Pass/No Pass.
Prerequisite: Completion of freshman LAH courses or instructor permission

LAH 2802 LDSH Summer Internship Review (1) **fall**
This is the review portion of LAH 2801. Pass/No Pass.
[Course fee: $250] Prerequisite: LAH 2801

Mathematics (MAT)

MAT 1040 Mathematics for Allied Health (2) **spring**
This course introduces basic concepts in general math: ratio; proportions, variation; statistics; two- and three-dimensional geometry (especially as related to volume); dosages and solutions; and US-metric conversions.
2 hours of lecture per week Prerequisite: Placement level 1

MAT 1210 Principles of Mathematics (3) **fall/spring**
This course reviews general math principles and introduces concepts for the solution of agricultural, agribusiness, and business problems. Topics covered include calculator use; basic algebraic operations, solution of linear and quadratic equations; geometry concepts of line, area, and volume; variation; trigonometry of right triangles; growth; compound interest; debt amortization; probability; and statistics.
3 hours of lecture per week Prerequisite: Placement level 2

MAT 1221 Finite Mathematics **(3)** **fall/spring**
This course introduces the student to a variety of mathematical tools to solve applied problems. Topics may include functions; graphing; linear models; matrices and linear systems of equations; linear programming; exponential models; elementary probability and statistics; and the mathematics of finance.
3 hours of lecture per week Prerequisite: Placement level 3 or *C-* or better in MAT 1210

MAT 1311 Precalculus I (3) **fall/spring**
This course is the first in a two-semester sequence of technical mathematics that stresses the relation of mathematics to engineering applications and development of an appreciation of the importance of precision in mathematical thought. It covers the use of a graphing calculator; basic geometry; solutions of linear and quadratic equations; right triangle trigonometry; algebraic fractions; and solving logarithmic and exponential equations.
3 hours of lecture per week Prerequisite: Placement level 4 or *C-* or better in MAT 1210

MAT 1312 Precalculus II (3) **as required**
This course is the second in a two-semester sequence of technical mathematics that stresses the relation of mathematics to engineering applications and development of an appreciation of the importance of precision in mathematical thought. It covers the use of a graphing calculator; algebraic fractions; exponents and radicals; proportions and variations; trigonometric functions; law of sines and cosines; vectors; operations with complex numbers; trigonometric identities and equations; and graphs of trig functions.
3 hours of lecture per week Prerequisite: MAT 1311

MAT 1340 Algebra & Trigonometry (5) **as required**
This course covers the necessary topics in algebra and trigonometry to provide the skills for MAT 1420 and is a bridge course for the student who has completed a lower level math course or who is off-sequence and has not placed into MAT 1311. Credit is not awarded for both MAT 1312 and MAT 1340 toward graduation.
5 hours of lecture per week Prerequisite: Placement level 3 or *C-* or better in MAT 1210 or 1221; department permission

MAT 1420 Technical Mathematics (5) **summer**
This course stresses the relation of mathematics to engineering applications and development of an appreciation for the importance of precision in mathematical thought. It covers use of the graphing calculator; solution of linear and quadratic equations; exponents and radicals; logarithms; exponential functions; right triangle trigonometry; laws of sines and cosines; vectors; operations with imaginary numbers; trigonometric identities and equations; and graphs of trigonometric functions.
5 hours of lecture per week Prerequisite: Placement level 4 or *C-* or better in MAT 1340

MAT 1520 Calculus for Engineering (4) **as required**
This course presents basic concepts of plane analytical geometry and calculus. Topics include differentiation and integration of algebraic, trigonometric, exponential, and logarithmic functions with emphasis on technical applications; maximum and minimum word problems; related rates; and applications of the integral to include area and volume.
4 hours of lecture per week Prerequisite: Placement level 5 or *C*- or better in MAT 1420

***MAT 2021 Statistics* (3)** **spring**
This course introduces the basic ideas and techniques of probability and statistics. Topics may include numerical and graphical descriptive measures, probability, random variables, the normal distribution, sampling theory, estimation, hypothesis testing, correlation, and regression. The use of technology may be required.
3 hours of lecture per week Prerequisite: Placement level 3 or *C*- or better in MAT 1210

MAT 2120 Discrete Structures (3) **spring**
This course introduces discrete structures in computer science and covers such topics as sets, set logic, relations, functions, proof techniques, induction, logic, graphical representations, and algorithms.
3 hours of lecture per week Prerequisite: Placement level 3 or *C*- or better in MAT 1210, 1221, or 1311

***MAT 2532 Calculus II* (4)** **fall/spring/summer**
This course is a continuation of calculus and includes techniques and applications of integration, indeterminate forms, and improper integrals, sequences, and series.
4 hours of lecture per week Prerequisite: *C*- or better in MAT 1520

***MAT 2533 Calculus III* (4)** **fall/spring**
This course's topics include the calculus of vector-valued functions; tangent and normal vectors; velocity; acceleration and applications; functions of several variables; partial derivatives; gradients; extreme values and applications; and multiple integration. Additional topics may include line and surface integrals; parametric surfaces; the theorems of Gauss, Green, and Stokes; and differential equations..
4 hours of lecture per week Prerequisite: *C*- or better in MAT 2532

MAT 3170 Applied Mathematics for Engineering (3) **spring**
This course introduces selected topics of advanced mathematics and applies them directly to areas of electrical and mechanical engineering analysis. The curriculum includes key methods of solution of both first and second order differential equations that are most useful in engineering analysis. Electrical and mechanical systems are modeled and their outputs are predicted using systems of integral and differential equations. Laplace transforms and numerical methods of solution are also covered.
3 hours of lecture per week Prerequisite: *C*- or better in MAT 2532

MAT 3720 Topics in Discrete Mathematics (3) **spring**
This course introduces fundamental topics in discrete mathematics that offer theoretical support for a variety of computer applications. Applications such as algorithm development and analysis, error analysis, and data encryption are best understood with a foundation in logic and writing proofs, set theory, combinatorics, probability, number theory, and abstract algebra. Additional topics may be covered depending on the interests of the class.
3 hours of lecture per week Prerequisite: MAT 2532 or *C*- or better in MAT 1312 and 2120 or MAT 1520

Mechanical Engineering Technology (MEC)

MEC 1010 Introduction to Mechanical Engineering Technology (1) **fall**
This course presents an introduction to the field of mechanical engineering technology; the knowledge and skills that define the discipline; and possible career options. The student learns and practices the use of spreadsheets to present and analyze information related to the field. Exercises are based on the field of mechanical engineering and expose the student to various topics (materials, energy, strength, fluids, heat, etc.) where information and numerical data are acquired, organized, analyzed, and presented. Other topics include career options, professional development, ethics, leadership, teamwork, and time management.
2 hours of lab per week

MEC 1011 Design Communication I (2) **fall**
This course provides a basic understanding of the principles and technology of mechanical drawing and computer modeling as methods of documenting and communicating mechanical designs. The concepts of geometric construction and orthographic, sectional, auxiliary, and assembly views are covered. Dimensioning methods and types of fasteners are introduced. The student gains basic proficiency in using a solid parametric three-dimensional computer-aided design (CAD) program to build parts, assemblies, and detailed working drawings.
6 hours of lab per week

MEC 1012 Design Communication II (2) **spring**
In this course, the student gains proficiency in communicating mechanical designs using hand drawing and computer modeling and building on the fundamentals learned in MEC 1011. In addition, the student gains skills in project management and teamwork. The student works in a team on short- and long-term mechanical design projects, maintaining electronic design notebooks and project web pages. The student practices two-dimensional and three-dimensional computer modeling and web authoring.
6 hours of lab per week Prerequisite: MEC 1011

MEC 1020 Manufacturing Processes (2) **fall/spring**
This hands-on course introduces the student to a wide variety of manufacturing processes. Although heavily focused on traditional machine tools (lathes, mills, grinders, etc.), the course also explores the processes of casting, welding, molding, and industrial cutting (plasma, water-jet, and laser). The student works in a small group to produce functional products using today's manufacturing standards. Safety and skilled operation are the focal points of this class.
1 hour of lecture, 3 hours of lab per week
[Course fee: $50]

MEC 1021 Manufacturing Processes Lab (1) **fall/spring**
This course introduces the student to machine tools; measuring instruments and machine operation; and how they relate to the manufacturing process.
3 hours lab per week
[Course fee: $35]

MEC 1040 Introduction to Materials Science & Engineering (3) **spring**
This course introduces the nature and properties of materials that are used in engineering applications. Materials are studied from the perspective of properties, processing, and structure and how they are interrelated. Topics common to all materials are covered including crystalline structure, mechanical behavior, and property testing. Topics related to metals are studied extensively including defects, phase formation, heat treating, the steel system, and alloy systems. The properties and structure of ceramics, polymers, and composites are also covered.
2 hours of lecture, 3 hours lab per week — Prerequisite: PHY 1041 or equivalent
[Course fee: $20]

MEC 1060 Metrology & Inspection Techniques (3) **fall**
This course provides the student with the fundamental concepts of modern dimensional metrology and related inspection techniques. Topics covered include the language and system of measurement; tolerances; metrology; statistics of metrology; measurement with graduated scales and scaled instruments; Vernier instruments; micrometer instruments; the development and use of gage blocks; measurement by comparison and high-amplitude comparators; pneumatic measurement; and calibration.
2 hours of lecture, 3 hours of lab per week

MEC 1070 Tool Geometry & Productive Metal Cutting (1) **as required**
This course helps the student understand the theory and practical applications of modern cutting-tool technology. After successfully completing this course, the student is competent to recognize and define the various geometries associated with cutting tools and how they relate to the material and manufacturing process.
4 hours of lab per week

MEC 1180 Introduction to Welding Processes (3) **as required**
In this course, the student learns the fundamentals of oxy-acetylene brazing, welding, and cutting processes; SMAW (Shielded Metal Arc Welding or stick); GMAW (Gas Metal Arc Welding or MIG); and GTAW (Gas Tungsten Arc Welding or TIG) welding processes and plasma cutting processes. A central component of this course is a lab in which the student learns many of the techniques and machines discussed in the lecture. A major component of the lab is lab safety. This course helps the interested student to prepare for American Welding Society (AWS) entry-level certifications.
2 hour of lecture, 3 hours of lab per week
[Course fee: $450]

MEC 1190 Advanced Welding Processes (2) **as required**
This course allows the student to pursue advanced welding techniques in one or more of the welding processes that lead to AWS pre-certification skills for those who want to obtain certification or focus on one or more of the processes covered in MEC 1180. The student learns blueprint reading for welders and the application of required national codes. Safety, liability, and business ethics are significant elements of this course.
1 hour of lecture, 3 hours of lab per week — Prerequisites: MEC 1180
[Course fee: $450]

MEC 2010 Fluid Mechanics & Fluid Systems (3) **fall**
This course examines the interrelationships between the nature of fluid properties; the behavior of fluids at rest and in motion; and the utilization of fluids to effectively accomplish a wide range of useful purposes. Lab experience and observation develops a working knowledge of fluid properties, fluid behavior, and fluid systems for power transmission and control.
2 hours of lecture, 3 hours of lab per week — Prerequisite: CIS 1050 or MEC 1010; PHY 1041
[Course fee $20] — Corequisite: MAT 1520

MEC 2035 Statics & Strengths of Materials (4) **fall**
This course focuses on two related topics: the analysis of mechanical systems under static load conditions and the resulting stress in the structures and materials. The course follows introductory physics and emphasizes similar problem-solving skills while addressing commonly used structures and mechanisms. The course begins with the analysis of forces and moments on static structures and mechanisms and then applies the methods of statics to analyze the stresses and strains in material structures due to tension and compression loads as well as

shearing and bending. Stress analysis is used to evaluate material strength and design limitations of structures and mechanisms.
3 hours of lecture, 3 hours of lab per week — Prerequisite: MEC 1011, 1050; PHY 1041
[Course fee: $20] — Corequisite: MAT 1520

MEC 2040 Computer-Aided Technology (2) **fall**
In this course, the student develops the skills to program CNC lathes and milling machines. Software-linked CAD programs with CNC machines and flexible machining systems are presented. In addition, the student is kept up-to-date on current developments in computer-aided technology.
1 hour of lecture, 3 hours of lab per week — Prerequisite: MEC 1011, 1020
[Course fee: $50]

MEC 2050 Thermodynamics & Heat Transfer (3) **spring**
This course familiarizes the student with the first and second laws of thermodynamics, the equations of state, perfect gas processes, and various power cycles. The student applies these principles to the analysis of devices which utilize the power cycles such as the Otto, Diesel, Rankine, and vapor-compression cycles. Conduction, convection, and radiation heat transfer are also introduced.
2 hours of lecture, 3 hours of lab per week — Prerequisite: MAT 1520; MEC 2010; PHY 1041 or equivalent
[Course fee $20]

MEC 2065 Kinematics & Dynamics (4) **spring**
In dynamic systems where objects and mechanical assemblies are moving, the accelerations and velocities are considered in order to analyze the motion and forces on an object. The student in this course acquires a thorough understanding of the displacement, velocity, acceleration, and force characteristics of plane motion and the associated graphical and computer-aided methods of analysis.
3 hours of lecture, 3 hours of lab per week — Prerequisite: MAT 1312; MEC 1011; PHY 1041 or equivalent
[Course fee $20]

MEC 2070 Machine Design Components (3) **as required**
This course familiarizes the student with the various types of machine elements that are used in mechanical design and helps them understand the design intent based on functionality, strength, and durability.
2 hours of lecture, 3 hours of lab per week
[Course fee $150]

MEC 2071 Machine Design (2) **spring**
Through this course, the student gains an understanding of the application of mechanical parts such as screws, gears, shafts, bearings, chains, belts, clutches, and brakes to the design of mechanical devices.
2 hours of lecture per week — Prerequisite: MEC 2035
Corequisite: MEC 2065

MEC 2150 Introduction to Solar PV Technology (3) **spring**
This course introduces the basics of solar photovoltaic (PV) technology including solar resource assessment; PV materials and modules; systems components; system sizing and design basics; mechanical mounting systems; installation methods; and performance analysis. Advanced topics current to the industry are also discussed. The course prepares a student to take the NABCEP PV Solar Entry-Level Knowledge Certificate exam.
2 hours of lecture, 2 hours of lab per week — Prerequisite: ELT 1031
[Course fee $25]

MEC 2720 Mechanical Projects (3) **spring**
Through this course, the student gains an understanding of the application of mechanical parts such as screws, gears, shafts, bearings, chains, belts, clutches, and brakes to the design of mechanical devices. A central component of the course is a team-based project to design and fabricate a mechanical system. This course is the capstone experience for the Mechanical Engineering Technology program.
2 hours of lecture, 3 hours of lab per week — Prerequisite: MEC 1020, 2035
[Course fee: $75]

MEC 3010 Wind Power (3) **fall**
This course introduces the concepts of wind power and associated technology. Topics addressed include the principles of wind energy and resource assessment; rotor and blade designs and the mechanical and electrical principles of wind turbine systems; different types of applications; and the economics and current policies related to wind power. The lab portion of the course involves the installation of anemometry equipment and data evaluation; fabrication and testing of simple rotors; turbine systems; and monitoring and evaluation of installed systems.
2 hours of lecture, 2 hours of lab per week — Prerequisite: PHY 1041
[Course fee $25]

MEC 3021 Manufacturing Processes II (3) **fall**
This course focuses on advanced manufacturing and production processes. Topics include concurrent and reverse engineering methods; automation in manufacturing; abrasive and grinding techniques; electrical discharge machining; hot wire; CNC welding and plasma processes; 3D printing; and other emerging methods.
2 hours of lecture, 2 hours of lab per week — Prerequisite: MEC 1011, 1020
[Course fee $75]

MEC 3031 Materials Processes (3) **fall**
A fundamental aspect of manufacturing is the processing of materials into products. This course focuses on the processes by which materials are economically processed into different shapes. The overall goal is to develop an understanding of the principles and practical knowledge of different materials processes and be able to apply that knowledge when considering the geometry, functionality, and materials required for a product. Topics covered address processes for metal, polymers, and ceramics and include machining, casting, forming, joining, sheet metal, extrusion, additive methods (3D printing), and coating processes.
2 hours of lecture, 2 hours of lab per week Prerequisite: MEC 1020
[Course fee $100]

MEC 3040 Bioenergy (3) **fall**
This course provides an overview of bioenergy technologies to replace fossil fuel-based heating systems while contributing to the production of renewable electricity and transportation fuels. Solid, liquid, and gaseous biofuels are introduced, though the course focuses on wood and grass biomass and anaerobic digestion of organic wastes. A variety of feedstock resources, processing, and characterization methods are covered along with various systems used for energy conversion by combustion/oxidation. Policy, permitting, transportation, economics, nutrient recovery, carbon cycling, and life cycle analysis are compared and contrasted. Case studies focus on systems installed in Vermont. Successful completion of CHE 1020 or CHE 1031 is recommended.
2 hours of lecture, 2 hours of lab per week Prerequisite: PHY 1041; SSC 2030
[Course fee $15]

MEC 3041 Advanced CNC Machining (3) **spring**
This course develops proficiency in the use of professional grade computer-aided manufacturing software and in the use and operation of CNC machine tools. Topics include the history and development of CNC machining, current technology, development of programs, setups, tool lists (cutting, precision measurement), material lists, fixtures, schedules, orders of operation, safety hazards, and preventive maintenance.
1 hour of lecture, 4 hours of lab per week Prerequisite: MEC 2040
[Course fee $75]

MEC 3170 Renewable Energy Heating (3) **spring**
This course provides an overview of heating systems that utilize solar, biomass, and geothermal energy. The principles of each type of technology are discussed as well as common topics including hydronic heating; system sizing; pumps and circulators; heat exchangers and storage tanks; sensors and controllers; plumbing components; integration; and performance analysis.
2 hours of lecture, 2 hours of lab per week Prerequisite: ARE 2031; PHY 1042
[Course fee $25] Corequisite: ARE 3050 or MEC 2050

MEC 4010 Lean Manufacturing (3) **spring**
This course develops proficiency in the methods and processes used for lean manufacturing. Topics include the fundamental principles of lean methods including the continuous recognition and elimination of waste in operations and reducing time from order to delivery while maintaining or improving product quality. The course focuses on understanding lean principles, practices, and techniques from both a technical standpoint and a people perspective, which is needed in order to effectively lead an organization to lean operation and sustain the improvement.
3 hours of lecture per week Prerequisite: MAT 2021

MEC 4020 Quality Assurance (3) **fall**
This course focuses on the principles and methods of quality assurance including measurement, control, improvement, and management, focusing on applications in the manufacturing field. The course introduces the scope and function of quality assurance, including basic definitions; statistics; quality policy and objectives; manuals and procedures; concept of variation; inspection and sampling techniques; meteorology process control; methods; and the elements of reliability. Current TQM and ISO 9000 standards are reviewed.
3 hours of lecture per week Prerequisite: MAT 2021

MEC 4120 Renewable Energy Modeling (3) **fall**
This course focuses on methods and tools used for modeling the performance of renewable energy (RE) systems. Topics covered include physical modeling of solar, wind, and bioenergy technologies; using renewable energy resource data in modeling RE systems; and using commercial tools for performance prediction.
1 hour of lecture, 4 hours of lab per week Prerequisite: MAT 1520, 2021; MEC 2150, 3170
Corequisite: MEC 3010, 3040

MEC 4721 Manufacturing Capstone Project (3) **spring**
This is a required capstone course for the Manufacturing Engineering Technology program that provides the student with an opportunity to apply a combination of skills and knowledge to solve an industrial or "real world" manufacturing problem. The student works in a group to tackle an integrated, technical problem presented by regional industry and approved by program faculty. Topics include manufacturing materials and processes, design, quality, lean manufacturing, and automation.
1 hour of lecture, 4 hours of lab per week Prerequisite: Completion of 40 credits toward major; MEC 1040, 3021, 3041
Corequisite: MEC 4010, 4020

MEC 4722 Renewable Energy Capstone Project (3) **spring**
This course applies knowledge and skills to a project that addresses a renewable energy system or process problem. The capstone project may involve engineering design; scientific research; modeling and simulation; policy and regulations; economic analysis; environmental analysis; operations and management planning; or other activities. If possible, the work is done in a team and includes identifying project scope and specifications; researching and proposing a technical solution; completing a design or process plan that addresses the problem; and communicating through oral and written reports.
1 hour of lecture, 4 hours of lab per week Prerequisite: MEC 4120

MEC 4801 MEC Internship (0) **summer**
This internship requires the student to spend at least 200 hours in a professional setting related to their field of study. The practicum broadens a student's understanding of a potential career path and applies gained knowledge and skills in a professional environment. Pass/No Pass.
Prerequisite: Completion of 60 credits toward major

MEC 4802 MEC Internship Review (1) **fall**
This course reviews the activities and responsibilities that a student experienced in MEC 4801 and is offered in the subsequent semester to award credit for completed work. Pass/No Pass.
Prerequisite: MEC 4801

Music (MUS)

MUS 1010 Music Appreciation **(3)** **as required**
This course introduces the art and craft of music. It deals with ways to listen to music; the basic elements of music; the use of these musical elements in the many genres and styles of Western European musical traditio;n and the way in which music may communicate ideas.
3 hours of lecture per week

MUS 1028 Introduction to Rock & Roll **(3)** **as required**
This course is a survey of rock and roll music from its origins through contemporary rock. The student discusses the social, economic, and political conditions that influenced the development of rock music and the artists who have contributed to its form. Through extensive listening, the student explores a variety of rock styles from the 1950s through the present.
3 hours of lecture per week

Nursing (NUR)

NUR 0111 Principles & Practices of Nursing I Lab (4) **fall**
This is the lab component of NUR 1111 and includes Math for Meds. Pass/No Pass.
12 hours of clinical/lab per week
[Course fee: $110] Corequisite: NUR 1111

NUR 0121 Principles & Practices of Nursing II Lab (4) **winter**
This is the lab component of NUR 1121. Pass/No Pass.
12 hours of clinical/lab per week Corequisite: NUR 1121

NUR 0131 Principles & Practices of Nursing III Lab (4) **spring2**
This is the lab component of NUR 1131.
18 hours of clinical/lab per week
[Course fee: $70] Corequisite: NUR 1131

NUR 1010 Pharmacology for Nursing (3) **winter**
This course teaches the classifications of drugs according to body systems and the use of these drugs for the purpose of restoring or maintaining health. Orem's theory is integrated into practical application based on a client's needs. The course begins with basic terminology and progresses to medication administration and standards and legislation as they relate to drugs. Topics include the role of the nurse, the nursing process, nutrition, and principles of ethics. A basic study of pharmacokinetics helps the student to understand how drugs are absorbed, transported, metabolized, and excreted. A review of pharmacotherapeutics focuses on how drugs are utilized by the human body and how the client's age and unique characteristics affect this process.
3 hours of lecture per week Prerequisite: BIO 2011; NUR 0111, 1020, 1111
Corequisite: BIO 2012

NUR 1020 The Nurse-Client Relationship (3) **fall**
The content of this course assists the student in coping with the human relations challenges encountered in their career. Discussions encourage the student to broaden their views and develop an awareness of the uniqueness of humanity. The course implements the philosophy and objectives of the program by stressing the importance of Orem's theory for the psyche as well as the body and presents basic principles, concepts, and information regarding communication, listening, and assertiveness. The student also learns the importance of confidentiality and ethical behavior as part of the interdisciplinary team. Additional presentations include the community; the family; cultural diversity; sexual harassment; death and dying; and the impaired professional.
3 hours of lecture per week Prerequisite: Instructor permission

NUR 1111 Principles & Practices of Nursing I (5) **fall**
This course provides an opportunity for the student to acquire the selected knowledge and skills necessary to meet the basic self-care needs of the assigned client in both long-term care and acute care settings. Course content emphasizes the role of the practical nurse in the recognition, description, and maintenance of health. Orem's Self-care Theory is integrated into practical application. Application of the nursing process in the care of clients with self-care deficits is the focus, with emphasis on data collection. Additional topics presented include the roles of various healthcare team members, concepts of effective communication, and effective maintenance of a safe and therapeutic environment. Initially, nursing arts laboratories are used for skill demonstration and practice with advancement toward clinical application.
5 hours of lecture per week — Corequisite: BIO 1030, 2011; NUR 1020
[Course fee: $110]

NUR 1121 Principles & Practices of Nursing II (5) **winter**
This course allows the student to reinforce and build upon previously learned information in order to provide safe, competent, standard nursing interventions to clients experiencing recurring healthcare problems in acute and long-term care settings. The student learns to care for groups of clients utilizing the nursing process to organize and implement nursing care and selects appropriate goals toward meeting the client's self-care needs. Observational experiences are provided in certain specialty areas. The student demonstrates the increasing ability to perform standard nursing interventions in the clinical environment with decreasing need for supervision.
5 hours of lecture per week — Prerequisite: BIO 1030; NUR 0111, 1020, 1111
Corequisite: BIO 2012; NUR 0121, 1010; PSY 1050

NUR 1131 Principles & Practices of Nursing III (5) **spring2**
This course explores integrative concepts in nursing and in the developing family. The student expands knowledge and increases skills necessary to meet the self-care deficits of individuals experiencing common healthcare problems with an emphasis on parent/child care and mental health. In addition to continuing to use the nursing classroom lab, the student also learns through selected clinical experiences in obstetric, pediatric, and medical-surgical settings. The student demonstrates skills in problem solving through the use of the nursing process with a focus on implementation and evaluation of nursing care.
7.5 hours of lecture per week — Prerequisite: NUR 0121, 1010, 1121; PSY 1050
[Course fee: $70] — Corequisite: NUR 0131

NUR 2010 LPN to RN Transition/Trends in Nursing (2) **fall**
This course assists the student in recognizing both personal and professional challenges that arise in the process of transitioning from the role of the practical nurse to the registered nurse. Issues and trends important to contemporary nursing are evaluated and analyzed. Theories regarding the transition process, role development, and the process of change are applied to personal adaptation, professional issues, and role differentiation in terms of responsibilities and scopes of practice for the LPN and ADN. Current issues are examined through assigned reading, written submissions, and lively discussions. The student ultimately develops an individual philosophy of differentiated nursing practice.
2 hours of lecture per week — Corequisite: NUR 2040 or department permission

NUR 2011 Advanced Pharmacology (1) **spring**
This course builds on knowledge gained in NUR 1010. It is a body system-oriented approach to analyzing the use of particular medications for complex medical/surgical conditions in clients across the lifespan. The student integrates and evaluates the effectiveness of each client outcome as it relates to their pharmacologic needs.
1 hour of lecture per week — Corequisite: NUR 2130, 2140

NUR 2030 Principles & Practice of Nursing IV (3) **fall**
This course is divided into three content areas: health promotion and physical assessment (3 weeks); psychiatric nursing (6 weeks); and maternity nursing (6 weeks). The health promotion and physical assessment portion of this course assumes prior knowledge of normal physiological and developmental parameters and focuses on assessing abnormal conditions and encouraging a maximum level of self-care by promoting healthy behaviors. Such topics as the importance of an accurate and complete health history, including a psychosocial, cultural, and spiritual assessment and a health risk appraisal, are included. The psychiatric nursing portion offers the student an opportunity to gain the tools necessary to assess, plan, and evaluate interventions in the care of the client population dealing with mental health needs. The student selects an appropriate role to assume in assisting clients to meet their mental health self-care needs. The maternity portion assumes previous learning of the normal and expected conditions relating to the maternity client. Assessment of, planning care for, implementing interventions for, and evaluation of the normal antepartal, intrapartal, and postpartal client at the level of the registered nurse are covered. The content builds on this and focuses on abnormal conditions and the role of the registered nurse. The student assists the maternity client and family to recognize their self-care needs.
3 hours of lecture per week — Prerequisite: PN License or department permission
[Course fee: $110] — Corequisite: NUR 2010, 2040

NUR 2040 Principles & Practices of Nursing IV Lab (2) **fall**
This course is divided into three content areas: health promotion and physical assessment (3 weeks), maternity nursing (6 weeks), and psychiatric nursing (6 weeks). Laboratory and clinical experiences are congruent with the material presented in NUR 2030. The student assists the client and family to recognize their self-care needs. The clinical experience offers the student an opportunity to gain the tools necessary to assess, plan, and evaluate

interventions in the care of client populations in general medicine, maternity, and mental health settings. Observational experiences are provided in multiple inpatient and outpatient areas. The student demonstrates skills in decision-making through the use of the nursing process with an emphasis on implementation and evaluation. The student also selects the appropriate roles to assume in meeting the patient's self-care needs. The student performs therapeutically in the clinical area with a decreasing need for instructor supervision.
6 hours of clinical/lab per week — Corequisite: NUR 2030
[Course fee: $60]

NUR 2130 Principles & Practices of Nursing V (5) **spring**
This course offers the student the opportunity to learn about patients across the lifespan experiencing complex acute medical/surgical illnesses and chronic self-care deficits. Observational experiences are provided in multiple areas such as intensive care, the emergency room, recovery room, clinics, and a home health agency. The student demonstrates skills in decision-making through the use of the nursing process with an emphasis on implementation and evaluation. The student also selects the appropriate roles to assume in meeting the patient's self-care needs.
5 hours of lecture per week — Prerequisite: BIO 2120; NUR 2010, 2030, 2040
[Course fee: $330] — Corequisite: NUR 2140

NUR 2140 Principles & Practices of Nursing V Lab (4) **spring**
This course is the lab component of NUR 2130 in which the student performs therapeutically in the clinical area with a decreasing need for instructor supervision.
12 hours of clinical/lab per week — Corequisite: NUR 2011, 2130
[Course fee: $70]

NUR 3100 RN to BSN: Online Transition (1) **as required**
This is the first class in the progression of the BSN program and includes orientation to the program, the library, and student resources; discussion and use of effective online communication and netiquette; and development and presentation of baccalaureate-level presentation.
1 hour of lecture per week — Prerequisite: Unencumbered RN license

NUR 3110 Nursing Informatics (3) **as required**
This course helps the student gain insight into ethics, safety, research, professional networking, telemedicine, and the future of informatics in nursing. The student gains an understanding of the ways information technology supports the acquisition of nursing knowledge with specific consideration given to the nursing role as a knowledge worker. The student appreciates the application of nursing informatics in achieving patient-centered care.
3 hours of lecture per week — Prerequisite: NUR 3100 or concurrent enrollment in NUR 3100

NUR 3120 Palliative & End-of-Life Care (3) **as required**
This course provides the student with knowledge surrounding pain control; symptom management of various organ systems; therapeutic communication with patients and their families; collaborations with ancillary teams; and options for non-medicinal approaches to symptom management. Through a series of case studies and online discussions, the student has a chance to role play encounters and detail interventions in complex cases using current evidence-based practices.
3 hours of theory per week — Prerequisite: BIO 2012; NUR 2011
Corequisite: NUR 3100

NUR 3121 Transitions of Care in Healthcare Reform (3) **as required**
This course provides practicing nurses with the content knowledge and skills required to effectively coordinate patient care transitions between care providers and settings as condition and care needs change. Online and observational experiences are designed to facilitate bridging the gap between the provision of nursing care in single settings to coordinating care across settings. Topics include health care reform; nursing role evolution and transformation; risk identification; care coordination; data measurement; and quality improvement. Care transition models including evidence-based methods and tools used by hospitals and community agencies across the nation to facilitate effective care transitions are examined. Emphasis is placed on patient-centric care provided through effective communication and care coordination among healthcare professionals, caregivers, and patients.
3 hours of theory per week — Prerequisite: BIO 2012; NUR 2011

NUR 3140 Pathophysiology & Assessment (4) **as required**
This course provides refinement of the student's physical assessment skills focusing on the assessment differences needed to recognize abnormal findings across the lifespan, especially with at-risk populations. Communication, health histories, and psychosocial impacts are explored in the development of holistic health assessment skills. Additionally, this course focuses on an introduction to the basic concepts of pathophysiology. The student examines the phenomena that produce alterations in human physiologic function and the resulting human responses.
4 hours of theory per week — Prerequisite: BIO 2012
Corequisite: NUR 3100

NUR 3210 Healthcare Systems (3) **as required**
In this course, the student gains an understanding of the ways healthcare is delivered, with emphasis on cost, access, the impact of globalization on healthcare, and outcomes. The student explores the role of the nurse

within the healthcare delivery system and with respect to other members of the healthcare team and explores the disparity of healthcare that exists in the US. The student discovers the history of healthcare delivery in the US and evaluates the efficacy of this system. At the completion of this course, the student can articulate a vision of healthcare delivery that examines the contributions of nursing professionals.
3 hours of theory per week — Corequisite: NUR 3100

NUR 4011 Teaching/Learning in Healthcare for Allied Health (3) as required
This course provides the student with the ability to recognize the teaching and learning needs of their patients. Healthcare providers have a philosophic basis for and a long history of providing patient education.
3 hours of theory per week — Prerequisite: NUR 3100

NUR 4012 Health Promotion Across the Lifespan (3) as required
This course focuses on the role of the nurse in promoting health and reducing risk behaviors of individuals and families across the lifespan. Examples of nutrition, physical activity, and stress management are examined with an emphasis on the impact of genetics, values, lifestyle, environmental, and cultural influences. Collaboration with other healthcare providers; integration of practice and policy while developing interventions; and patient teaching as essential functions of the nurse are emphasized.
3 hours of theory per week — Prerequisite: NUR 3110, 3120, 3140
Corequisite: NUR 3210; PSY 3070

NUR 4110 Research & Evidence-Based Practice (4) as required
This course increases the practicing nurse's knowledge of evidence-based practice, which is defined as the synthesis of scientific evidence, clinical judgment, patient preferences, and available resources. Course objectives include formulating clinical questions, performing database searches, appraising retrieved evidence, and developing a quality improvement project on a topic of interest.
4 hours of theory per week — Prerequisite: MAT 2021

NUR 4130 Nursing Leadership & Management (6) as required
This course prepares the student to assume nursing leadership and management roles with focus on their interactions with the healthcare team members in future work settings. It familiarizes the student with management theories; organizational and behavior theories; and leadership styles that are relevant to the practice of nursing management. It explores the elements of the management process as well as change management strategies and their applications and enhances leadership skills in maintaining best practices and standards of care. Nursing units in hospitals are the framework used for the application of the theories and knowledge base included in this course.
3 hours of theory per week, 135 hours of preceptorship per term — Prerequisite: NUR 3100

NUR 4210 Global Health & Population-Based Healthcare (3) as required
The health of the world's inhabitants has been impacted by pandemics, environmentally caused disease, terrorism, and disasters and nurses are being called upon to care for and improve the lives of affected individuals. There is a great need for nurses who understand global connectedness and the causes and consequences of the distribution of health, illness, injury, and disease. This course presents an overview of global health from the viewpoint of nursing and introduces the student to the public health field and the critical links between global health and social and economic development. The emphasis of the course is on underdeveloped countries and topics include measures of disease burden; ethics and human rights; environmental health and safety; disparities in the health of women and children; communicable diseases; nutritional challenges; intercultural communication; health and literacy of the marginalized adult; and cultural competency skills.
3 hours of lecture per week — Prerequisite: NUR 3100

NUR 4410 Community Health (6) as required
This course explores the role of the nurse generalist in the community setting, focusing on the prevention of disease and promotion of health in population aggregates. The course examines community theory, change theory, epidemiology, and health care resources which support disease prevention and health promotion. These provide a basis for public health nursing and the ability to apply this knowledge base to care for, promote, maintain, and restore the health of communities. Emphasis is on effective community health practice through assessment, program planning, and nursing care for individuals, families, and vulnerable populations. The changing needs of an increasingly culturally diverse population within the social context of community systems are examined, along with environmental, economic, political, and legal constraints to the health of community systems. Course content integrates concepts from nursing and public health sciences. The student conducts an in-depth community assessment employing basic epidemiological principles and data collection strategies utilizing the nursing process while engaging in health promotion and maintenance strategies in community health settings and in assessing and planning interventions for high-risk populations. The student implements a community change project based on the assessment of their community and utilizing change theory.
4 hours of theory per week, 90 hours of preceptorship per term — Prerequisite: NUR 3100; MAT 2021; SOC 1010

Philosophy (PHI)

PHI 1010 Introduction to Philosophy **(3) as required**
In examining the history of philosophy from Socrates to Sartre, the student looks at the diverse perspectives, methods, and conclusions of significant philosophers, both classical and contemporary, concerning selected

topics in metaphysics, epistemology, ethics, political philosophy, and aesthetics. Class discussion of reading is directed toward an increased understanding of significant contemporary problems in light of the relevant philosophical issues.
3 hours of lecture per week

***PHI 1030 Introduction to Logic* (3)** **as required**
This course is a study of the principles of good reasoning, including the nature of argument and inference; deductive and inductive reasoning; and informal fallacies.
3 hours of lecture per week

***PHI 1040 Introduction to Ethics* (3)** **as required**
This course introduces some of the major ethical theories about morally right action, the morally good person, and the just society. Such theories may include ethical absolutism, ethical relativism, ethical egoism, utilitarianism, formalism, and rights theory. Topics may be drawn from contemporary moral issues such as capital punishment, abortion, and euthanasia.
3 hours of lecture per week

Physics (PHY)

PHY 1030 General Physics (4) **spring**
This general physics course introduces the student to basic classical physics. Topics include Newtonian mechanics, elasticity, fluids, heat transfer, and DC circuits.
3 hours of lecture, 3 hours of lab per week — Prerequisite: MAT 1210

***PHY 1041 Physics I* (4)** **as required**
This course gives the engineering technology student a thorough study of the basic principles of physics. Topics covered in this course are systems of measurement; dynamics, including motion, acceleration, forces producing motion, work, energy, and power; momentum and the conservation laws; statics, including concurrent and noncurrent forces; and fluids, including properties of gases, fluid pressure, density, buoyancy, and hydraulics. Prior successful completion of a physics course is recommended.
3 hours of lecture, 3 hours of lab per week

***PHY 1042 Physics II* (4)** **as required**
This course is a continuation of PHY 1041. Emphasis is on understanding basic physical concepts that relate both to practical situations and to subsequent technical courses. The fundamental structure of the course provides the student with a firm foundation for the understanding of semiconductor physics. Topics include heat; wave motion; electrical and magnetic field theory; light; and solid-state physics.
3 hours of lecture, 3 hours of lab per week — Prerequisite: PHY 1041
Corequisite: MAT 1420

PHY 2041 Fundamentals of Physics with Calculus I (4) **fall/spring**
This course is an alternative for PHY 1041 intended to give the engineering technology student with strong verbal and math skills a course with the application of calculus as its math component. Topics covered include system of measurement; dynamics, including motion, acceleration, forces producing motion, work, energy, and power; momentum and the conservation laws; statics, including concurrent and non-concurrent forces; and fluids, including properties of gases, fluid pressure, density, buoyancy, and hydraulics. Prior successful completion a physics course is recommended.
3 hours of lecture, 3 hours of lab per week — Corequisite: MAT 1520

PHY 2042 Fundamentals of Physics with Calculus II (4) **fall/spring**
This course is a continuation of PHY 2041. Emphasis is on understanding basic physical concepts in practical situations and in subsequent technical courses developed in the student's major field of study. The fundamental structure of the course provides the student a firm foundation for the study of semi-conductor technology. Topics include thermodynamics; wave motion; electrical and magnetic fields; light; and solid state physics.
3 hours of lecture, 3 hours of lab per week — Corequisite: MAT 1520

***PHY 3120 Introduction to Modern Physics* (3)** **spring**
This calculus-based course continues the study of classical physics and introduces the student to topics in modern physics such as special relativity, atomic theory, solid state physics, nuclear physics, and elementary particle theory.
3 hours of lecture per week — Prerequisite: MAT 1520; PHY 1042 or equivalent

Political Science (POS)

***POS 1020 American Politics & Government* (3)** **as required**
This course observes the origin, structure, and operation of the American political system in the context of federalism, constitutional law, and the obligations and rights of the citizen.
3 hours of lecture per week

***POS 2110 State & Local Government* (3)** **as required**
This course provides a study of the principles and problems of American government at the state and local level.
3 hours of lecture per week — Prerequisite: ENG 1061 or equivalent

Psychology (PSY)

***PSY 1010 Introduction to Psychology* (3)** **fall/spring**
This course introduces the student to the major concepts, issues, research, and scientific methods upon which our knowledge of human thought and behavior are built. The course provides the basis for further study of psychology as well as a sense of how psychological issues are involved in a variety of academic fields and the student's personal life. Course content is selected from topics including research methods, neurophysiology, states of consciousness, learning, memory, theories of personality, motivation, social psychology, and abnormal behavior.
3 hours of lecture per week

***PSY 1050 Human Growth & Development* (3)** **winter**
This course offers an overview of the human developmental process throughout the life cycle, which includes the social, moral, emotional, cultural, physical, and cognitive aspects of growth. The student is encouraged to explore their own development. The theories of Erikson, Freud, Kohlberg, Piaget, and others are integrated into the life-span overview.
3 hours of lecture per week Prerequisite: Instructor permission

***PSY 2110 Educational Psychology* (3)** **summer**
This course provides an examination of the principles and theories of learning as they apply to the developmental changes of the child. Special emphasis is placed on how the child learns and ways of producing optimal conditions for childhood learning.
3 hours of lecture per week

***PSY 3070 Abnormal Psychology* (3)** **summer**
This course focuses on the symptoms, causes, and treatment of a wide variety of psychological disorders, such as mood disorders, anxiety, schizophrenia, personality disorders, somatoform disorders, dissociative disorders, childhood disorders, eating disorders, sexual disorders, and organic brain syndromes. It also explores historical views of understanding and treating abnormal behavior and diagnostic methods used to classify disorders.
3 hours of lecture per week Prerequisite: PSY 1010

Respiratory Therapy (RSP)

RSP 1009 Introduction to the Profession of Respiratory Therapy (1) **fall**
This course introduces the profession of respiratory therapy with emphasis on the duties, responsibilities, and qualifications of a respiratory therapist. Current trends in professional practice and the value of volunteering in the community are also discussed. This course is specifically designed for the student enrolled in the three-year respiratory therapy curriculum. Pass/No pass.
1 hour of lecture per week

RSP 1010 Foundations of Respiratory Care (3) **fall**
Cardiopulmonary anatomy and physiology are introduced as the basis for understanding clinical applications of respiratory care, thus encouraging the student to understand the rationale for making clinical decisions that involve patient assessment and therapeutic measures.
3 hours of lecture per week Corequisite: RSP 1011

RSP 1011 Respiratory Care I (5) **fall**
This course introduces the student to allied health communication along with legal and ethical issues confronting the respiratory therapist and teaches them to perform the basic assessment skills required to make an objective evaluation of a patient's condition or response to therapy. The student begins to develop the competence required to deliver specific respiratory care therapeutics to patients.
4 hours of lecture, 3 hours of lab per week
[Course fee: $125] Corequisite: RSP 1010

RSP 1012 Respiratory Care II (4) **spring**
In this course, the student learns the skills and techniques of managing and treating patients with respiratory needs. The clinical effects of various types of respiratory therapy and diagnostic techniques are explored. Oxygen therapy, aerosol therapy, and respiratory drugs are thoroughly discussed. Hyperinflation therapy, pulmonary hygiene, and chest physical therapy are covered, as are techniques of airway management.
3 hours of lecture, 3 hours of lab per week Prerequisite: BIO 2011; RSP 1010, 1011
Corequisite: RSP 1210, 1601

RSP 1210 Respiratory Anatomy & Physiology (3) **spring**
This course teaches the basic physiology of the pulmonary system. The physiological principles underlying various therapeutics, diagnostic, and monitoring procedures in respiratory care are detailed. The student interprets patient data, solves problems, and analyzes patient cases using these physiological concepts.
3 hours of lecture per week Prerequisite: BIO 2011; RSP 1010, 1011
Corequisite: RSP 1012, 1601

RSP 1601 Respiratory Clinical Field Experience (2) **spring**
This is a field experience of one day per week that allows the student to become familiar with the hospital setting

and perform basic respiratory therapy in acute care areas of the hospital. Pass/No Pass.
8 hours of clinical per week — Prerequisite: BIO 2011; RSP 1010, 1011
Corequisite: RSP 1012, 1210

RSP 2011 Cardiopulmonary Disease I (4) **fall**
Analysis of respiratory disturbances require an understanding of the etiology, pathophysiologic, and clinical signs of the disease. The study of cardiopulmonary disease begins with a presentation of advanced clinical assessment techniques. Measures used to evaluate oxygenation, ventilation, electrophysiology of the heart, and hemodynamics are discussed in relation to respiratory assessment of the critically ill patient.
4 hours of lecture per week — Prerequisite: RSP 2801
Corequisite: RSP 2013, 2602

RSP 2012 Cardiopulmonary Disease II (5) **spring**
This course is a continuation of RSP 2011 and presents diseases affecting the pulmonary system. For each disease, emphasis is place on etiology and pathogenesis, pathology, pathophysiology, and clinical features. A case study approach is utilized to enhance the student's ability to exercise judgement in handling patient complaints; collecting and examining data; formulating treatment options; assessing patient responses to treatment; and modifying therapy. The student is also prepared for the NBRC Board Examination.
5 hours of lecture per week — Prerequisite: BIO 2120; RSP 2011, 2013, 2602
Corequisite: RSP 2603, 2802

RSP 2013 Respiratory Care III (5) **fall**
This course leads the student through an ordered approach to modern ventilator care. A systematic development of mechanical ventilation competencies is laid out concept upon concept. Noninvasive and invasive monitoring of the patient on mechanical ventilation are also presented. In the classroom, the student applies these concepts to patient care scenarios. In the lab, the student completes a series of mechanical ventilation, intubation, extubation, and critical care monitoring competencies.
4 hours of lecture, 3 hours of lab per week — Prerequisite: RSP 2801
Corequisite: RSP 2011, 2602

RSP 2602 Respiratory Clinical Field Experience II (4) **fall**
This is a field experience of two days per week that allows the student to work in clinical areas in which they have received instruction. The student is directly and indirectly observed performing respiratory care in the critical and acute care settings. Pass/No Pass.
16 hours of clinical per week — Prerequisite: RSP 2801
Corequisite: RSP 2011, 2013

RSP 2603 Respiratory Clinical Field Experience III (6) **spring**
This course to provides supervised clinical experience in the critical care and specialty service areas of the hospital and the community. There is a strong emphasis on intensive care techniques and procedures. Instruction takes place in the adult, pediatric, and neonatal areas. The student is introduced to infant and pediatric mechanical ventilation and home care and continues to gain proficiency in adult care throughout the medical system. Pass/No Pass.
24 hours of clinical per week — Prerequisite: RSP 2602
Corequisite: RSP 2012, 2802

RSP 2801 Respiratory Internship (0) **summer**
This summer field experience is two days per week and allows the student to practice in clinical areas in which they have received instruction. The student explores non-traditional roles for respiratory therapists, volunteer their time in a selected area of practice outside the traditional hospital practice, and summarize their experiences in written and oral reports. The student creates a case study presentation while applying evidence-based medicine guidelines. Pass/No Pass.
16 hours of clinical per week, 32 volunteer hours prior to graduation — Prerequisite: BIO 2012; RSP 1012, 1210, 1601

RSP 2802 Respiratory Internship Review (1) **spring**
This is the review for RSP 2801. Pass/No Pass.
[Course fee: $250] — Prerequisite: RSP 2012, 2801

Sociology (SOC)

***SOC 1010 Introduction to Sociology* (3)** **fall**
This course is a survey of the basic issues, concepts, theories, and methods of sociology. The student learns to think critically about the nature of society and social institutions and the relationship among individuals and groups. Topics include social organization; socialization and social change; social stratification; class and class conflict; gender, race; and ethnicity.
3 hours of lecture per week

Social Science (SSC)

SSC 2010 Science, Technology, & Society (3) **as required**
This course explores the ways that science and technology are related to the broader social context of human

civilization. Case studies illustrate the social and environmental impacts of science and technology and the ways that social structures influence the development of science and technology. Guest lecturers discuss the responsibility of the individual technician. The student gives oral presentations and engages in class debates.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

SSC 2030 Energy Systems & Sustainability (3) **fall**
This course covers the historical, societal, economic, and technological factors that drive the development of a sustainable energy infrastructure.
3 hours of lecture per week | Prerequisite: ENG 1060

SSC 2120 Gothic Themes & Social Issues in Film (3) **as required**
Since the creation of the earliest copyrighted motion picture in January 1894, filmmakers have chronicled the fears, anxieties, and cultural changes inherent within American culture. No film genre has captured or reflected these cultural changes as aptly or as in-depth as American horror. History and film scholars both contend that these films are one of the best measures of the American consciousness. This course examines the changes and shifts in American cultural attitudes and values and explores the fears that accompany them. It asks the student to reflect on how these attitudes, values, and fears are reflected in pertinent films of each decade and to what extent these films also validate and cause further shifts within American culture.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

SSC 2130 Labor Studies (3) **as required**
This course explores labor unions; work and technology; and their impacts on American history.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

SSC 2720 The Social Ecology of Food (3) **fall**
This course examines social, cultural, political, economic, environmental, and ethical issues related to agriculture and food production, distribution, and consumption, and invites the student to consider more mindful approaches to food in their own life.
3 hours of lecture per week | Corequisite: ENG 1061 or equivalent

SSC 3010 Community Service: Local & Global (3) **as required**
This course explores the concepts of community, service, and honor through rigorous study of current cultural events and trends; literature (political, religious, and aesthetic); and the student's own ethics and values. The course begins with an overview of historical definitions of service so that the student is better able to understand their opinions and actions within a historical and global context. A major segment of this course involves direct service, providing the student with ongoing hands-on experience for reflection and analysis along with reading, writing, research, and classroom discussion.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

SSC 3045 News & Newspapers (3) **as required**
This course explores the nature of news: what is news, who controls news, how news is presented, and the many ways that news and newspapers affect our daily lives. Emphasis is placed on how news can contribute to being an informed citizen as well as how news can be manipulated to influence public opinion and policy.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

SSC 3120 Gothic Themes & Social Issues in Film (3) **as required**
This advanced writing course offers a deeper and more in-depth focus than SSC 2120 with the same goals. The course is offered online and is writing-intensive.
3 hours of lecture per week | Prerequisite: ENG 1061 or equivalent

Veterinary Technology (VET)

VET 1020 Animal Anatomy & Physiology (4) **spring**
This course covers the anatomy and physiology of organs and organ systems in animals with an emphasis on basic physiology common to domestic animals.
3 hours of lecture, 3 hours of lab per week | Prerequisite: BIO 2320
[Course fee: $20]

VET 1030 Animal Care & Restraint (3) **fall**
This course teaches the principles of management which are fundamental to animal health. The student is introduced to the basics of animal behavior; handling and restraint; feeding; housing; and disease prevention. Labs stress hands-on experience with handling, restraint, physical exam, and administration of medications to common domestic species and lab animals. Proficiency in performance of lab tasks is evaluated.
2 hours of lecture, 3 hours of lab per week

VET 1040 Animal Diseases (4) **spring**
This course explores bacterial, viral, fungal, and parasitic diseases with a review of disease prevention practices. Labs concentrate on diagnostic techniques including microbiology; fungal cultures and evaluations; parasitological specimen collection and processing; necropsy procedures; specimen handling; and shipping specimens to other laboratories.
3 hours of lecture, 2 hours of lab per week | Prerequisite: BIO 2320; VET 1030

VET 1051 Animal Care I (1) **fall**

This course gives the student hands-on experience in the daily care and maintenance of farm, lab, and pet animals and is repeatable for credit. The student is assigned times to care for the colony dogs, cats, rodents, birds, sheep, horses, and dairy animals under supervision. Pass/No Pass.

VET 1052 Animal Care II (1) **spring**

This course gives the student hands-on experience in the daily care and maintenance of farm, laboratory, exotic, and domestic animals and is repeatable for credit. The student learns what is required to properly document all interaction with animals housed in this facility and works with a partner to encourage teamwork. Pass/No Pass.

Prerequisite: VET 1051

VET 1060 Veterinary Lab Techniques (4) **spring**

In this course, the student learns to perform venipunctures, complete blood counts, urinalyses, serum chemistries, and supplemental hematologic evaluations on all species studied in VET 1030. Proficiency in performing tasks in the labs is emphasized.

3 hours of lecture, 3 hours of lab per week — Prerequisite: BIO 2320; VET 1030

VET 2011 Veterinary Clinical Techniques I (4) **fall**

In this course, the student learns the stages of anesthesia and how to induce and monitor anesthesia under direct supervision of a veterinarian. Surgical nursing skills associated with aseptic technique and proper protocols in the surgery suite are covered as well as pre- and post-op monitoring, record keeping, and client education skills. The student performs blood work, urinalysis, and fecal examination on animals that are scheduled to be anesthetized as medically indicated. Some preparatory work and patient monitoring is required outside of scheduled lab time.

3 hours of lecture, 3 hours of lab per week — Prerequisite: VET 1020, 1040, 1060, 2801

VET 2012 Veterinary Clinical Techniques II (3) **spring**

This course provides instruction in radiography of both large and small animals. The labs review anesthesia while the student learns to position animals for radiographs and develop, handle, and store the films. Ancillary techniques such as dentistry procedures are also covered. The student performs blood work, urinalysis, and fecal examination on animals that are scheduled to be anesthetized as medically indicated and perform post-anesthesia monitoring. Some preparatory work and patient monitoring is required outside of scheduled lab time.

2 hours of lecture, 3 hours of lab per week — Prerequisite: VET 2011, 2050, 2070

VET 2030 Animal Nutrition (2) **fall**

This course covers various nutrients and their metabolism and diet formulation for common domestic and lab animals, including species variation in nutritional requirements. Practical information regarding client education for feeding both large and small animals is presented, as is the use of prescription diets for small animals. Nutritional-related diseases are also discussed.

2 hours of lecture per week — Prerequisite: VET 1020

VET 2040 Reproduction & Genetics (3) **spring**

This course provides instruction in genetics and comparative reproductive physiology of domestic animals and covers reproductive management, including heat detection; determination of pregnancy; management of pregnant animals and parturition; and reproductive failure. The student learns how to assist a veterinarian with reproductive and obstetrical procedures.

3 hours of lecture per week — Prerequisite: VET 2070

VET 2050 Veterinary Applied Lab Methods (4) **fall**

In this course, the student learns medical nursing skills including bandaging, responding to medical emergencies, performing CPR, handling trauma cases, preparing animals for specific diagnostic procedures, obtaining an EKG, completing blood transfusions, and offering fluid therapy. Cytological specimens are collected and evaluated.

3 hours of lecture, 3 hours of lab per week — Prerequisite: VET 1020, 1040, 1060

VET 2060 Veterinary Office Procedures (3) **spring**

In this course, the student reviews material on professionalism and interactions with clients that they have been introduced to in other courses. The course provides additional information on interpersonal communication, professional correspondence, legal issues regarding medical records, organizing an office, financial record keeping, OSHA compliance, evaluating a potential job position, and getting and keeping a job.

3 hours of lecture per week — Prerequisite: Sophomore standing or instructor permission

VET 2070 Veterinary Pharmacology & Toxicology (3) **fall**

This course reviews dose calculation, dispensing, and administration of medications. The metabolism of commonly used veterinary medications and their beneficial and potential harmful effects on the body are covered. The student becomes familiar with common poisonous substances and plants and learns how to assist a veterinarian in treating toxicity cases.

3 hours of lecture per week — Prerequisite: VET 1020, 1040, 1060

VET 2080 Animal Behavior (2) **spring**

This course gives the student a grounding in the natural behaviors of common domestic species. Neural, ge-

netic, and endocrine bases for these behaviors are included. In addition, many aspects of clinical behavioral medicine are covered, including patient history-taking; reviews of common behavioral problems of dogs and cats; patient evaluation; behavior modification; and drug therapy.
2 hours of lecture per week Prerequisite: Sophomore standing or instructor permission

VET 2090 Veterinary Technician National Exam Prep Seminar (1) spring
This course is a comprehensive review of the core curriculum material presented in the first three semesters of the program to prepare the student for standardized professional examinations such as the Veterinary Technician National Exam (VTNE). Pass/No Pass.
2 hours of seminar per week Prerequisite: VET 2011, 2030, 2050, 2070

VET 2720 Veterinary Supervisor (1) fall/spring
This supervisory course is required for all veterinary technology students and is repeatable for credit. Pass/No Pass.
Prerequisite: Sophomore standing; 2 semesters of VET 1051

VET 2801 Summer Externship (0) summer
The student is enrolled in an externship after successful completion of the first-year core curriculum. The externship consists of a summer practicum of a minimum of 300 hours. The student may attend one or more sites in order to gain the appropriate experiences. Successful completion of the externship is required for graduation. Pass/No Pass.
Prerequisite: Sophomore standing

VET 2802 Summer Externship Review (1) fall
After successful completion of VET 2801, the student is enrolled in the externship review in the subsequent fall term. The review is a letter-graded course.
[Course fee: $250] Prerequisite: VET 2801

Special Topics (XXX)

XXX X610 Special Topics as required
These courses are for one-time or special offerings that do not have an approved course number. They may be in any subject area and the credits may vary. The special topics course requirements and evaluation criteria are developed by the instructor, subject to department approval. Details of specific course content are available from the department chair for the subject offered.

XXX X620 Special Topics as required
These courses are for one-time or special offerings that do not have an approved course number. They may be in any subject area and the credits may vary. The special topics course requirements and evaluation criteria are developed by the instructor, subject to department approval. Details of specific course content are available from the department chair for the subject offered.

XXX X710 Special Topics as required
These courses are for one-time or special offerings that do not have an approved course number. They may be in any subject area and the credits may vary. The special topics course requirements and evaluation criteria are developed by the instructor, subject to department approval. Details of specific course content are available from the department chair for the subject offered.

XXX X720 Special Topics as required
These courses are for one-time or special offerings that do not have an approved course number. They may be in any subject area and the credits may vary. The special topics course requirements and evaluation criteria are developed by the instructor, subject to department approval. Details of specific course content are available from the department chair for the subject offered.

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MEd, Johnson State College

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Sefik Gosto
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BA, University of Iowa
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AAS, Vermont Technical College

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David Race, Jr.
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Karen Tetreault
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Richard Wright
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Emeritus Faculty

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MAT, Norwich University

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BS, Lafayette College
DVM, Cornell University

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Professor of Mathematics, Emeritus
BS, Cooper Union School of Engineering
MS, Columbia University

Ned E. Herrin, Jr., PE *(deceased)*
Professor of Civil & Environmental Engineering Technology, Emeritus
BSCE, University of New Hampshire
MSCE, Purdue University

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BS, Clarkson College of Technology
MS, Rensselaer Polytechnic Institute

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MS, University of Wisconsin

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AB, Wesleyan University
MEd, Harvard University

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BS, Northeastern University
MEd, Johnson State College

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Assistant Professor: Nursing
BSN, Sacred Heart University
MSN, Walden University

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Professor & Chair: Diesel
BS, University of Massachusetts , Amherst

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Professor: Science
BS, Michigan State University
MS, PhD, University of Massachusetts

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Professor: Nursing
AAS, SUNY, Fulton Montgomery Com Col
BSN, MA, Norwich University
MSN, Medical University of the Americas

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Assistant Professor: Science
BS, Northwestern Oklahoma State University

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Professor: Computer & Information Systems
BSEE, Western New England College
MSEE, University of Illinois
PhD, University of Vermont

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Assistant Professor: Mechanical
BS, MS, University of California: Davis

J. Mark Corrao (1976)
Professor: Electrical & Computer
BSEE, University of Maine
MSEE, Purdue University

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Assistant Professor: Nursing
LPN, ADN, New Hampshire Technical College
BSN, Franklin Pierce University

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Assistant Professor: Nursing
BA, Denison University
MS, San Francisco State University

Kimberly Crowe (2013)
Assistant Professor & Chair: Agriculture
BS, University of Illinois: Chicago
DVM, St. Matthews University

Craig A. Damon (2007)
Associate Professor: Computer & Information Systems
BA, Bowdoin College
PhD, Carnegie Mellon University

Linda M. Davis (1989)
Professor: Mathematics
BS, SUNY Albany
MA, Norwich University

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AE, Vermont Technical College
BS, Norwich University
MS, University of Vermont

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Assistant Professor: Science/Vet Technology
BA, Trinity College
DVM, PhD, Tufts University

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BS, Seton Hall University
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JD, Vermont Law School

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BS, University of Wales, College of Swansea

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MS, University of Vermont

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Professor: EHSS
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For part-time faculty, go to http://www.vtc.edu/meet-vtc/directory

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Fire Science

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VT Fire Academy, Pittsford, VT

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Burlington Fire Department, Burlington, VT

Chief Ken Morton
Williston Fire Department, Williston, VT

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St. Johnsbury Fire Department, St. Johnsbury, VT

Captain James Wheatly
Lebanon Fire Department, Lebanon, NH

Landscape Design & Sustainable Horticulture

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Stowe, VT

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Church Hill Landscape, Charlotte, VT

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Chippers, Woodstock, VT

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River's Bend Design, Moretown, VT

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LAND Group, Addison, VT

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Nursing Programs

BSN

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Central Region

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Northeast Kingdom Region

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