
Vermont Technical College

Catalog 2012-2013

Bachelor of Science

Architectural Engineering Technology
Business Technology and Management
Computer Engineering Technology
Computer Information Technology
Computer Software Engineering
Construction Management
Dental Hygiene
Diversified Agriculture
Electrical Engineering Technology
Electromechanical Engineering Technology
Equine Studies
Professional Pilot Technology
Sustainable Design and Technology

Associate of Applied Science

Agribusiness Management Technology
Architectural and Building Engineering Technology
Automotive Technology
Business Technology and Management
Construction Management
Dairy Farm Management Technology
Diesel Power Technology
Fire Science
General Engineering Technology
Landscape Design and Sustainable Horticulture
Telecommunications Technology
Veterinary Technology

Associate of Science

Computer Information Technology
Computer Software Engineering
Dental Hygiene
Nursing
Respiratory Therapy

Associate of Engineering

Civil and Environmental Engineering Technology
Computer Engineering Technology
Electrical Engineering Technology
Mechanical Engineering Technology

Certificate

Practical Nursing

Foreword

This catalog has been prepared to give prospective students at Vermont Technical College a comprehensive preview of the college.

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 at any time. Students will be deemed to have had sufficient notice of all official regulations when such are contained in official publications or posted on the college's web site, www.vtc.edu. Should you have questions not answered in this catalog, please e-mail 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
Admissions Office: (800) 442-8821 or (802) 728-1444
Fax: (802) 728-1390

Non-discrimination and 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 728-1396. For questions related to Title IX, please contact Eric Braun, Dean of the Students and Title IX coordinator at ebraun@vtc.edu or via mail at PO Box 500, Randolph Center, Vermont 05061.

Academic Calendar 2012-2013

2012 FALL TERM

Monday	August 6	Non-matriculated student registration begins
Monday	August 13	NEK orientation for Nursing students, LSC 9-4 pm
Tuesday	August 14	New faculty orientation Randolph orientation for Nursing students 9-4 pm
Wednesday	August 15	Williston orientation for Nursing students 10:30-6 pm Williston campus student orientation 12-6 pm
Thursday	August 16	Randolph orientation for late admit students 9 am Randolph orientation for veterans/transfer students 1-3 pm
Friday	August 17	Residence halls open for new students 9 am Welcome weekend starts for new students 1 pm
Saturday	August 18	All-faculty meeting 8:30 am Academic Day: first-year student advising/department meetings
Sunday	August 19	Residence halls open for return students 1-4 pm Convocation 4 pm
Monday	August 20	Classes begin for all students on all campuses Late student registration begins 8 am
Friday	August 24	Last day to add courses
Monday	September 3	Labor Day: no classes
Saturday	September 29	Alumni Day
Friday	October 5	Midterm grades posted Deadline for I grade from spring or summer Vacation begins after classes for non-PN students
Monday	October 8	PN: Residence halls open 1 pm PN: Dining hall opens 5 pm PN: Columbus Day: no classes
Friday	October 12	Last day for PN students to drop with a W (60% pt.)
Sunday	October 14	Residence halls open 1 pm Dining hall opens 5 pm
Monday	October 15	Classes resume for non-PN students
Saturday	October 20	Williston campus Open House
Monday	October 22	PN student faculty evaluation period begins
Friday	October 26	Last day for non-PN students to drop with W (60% pt.)
Saturday	October 27	Randolph campus Open House
Tuesday	October 30	Student faculty evaluation period begins
Thursday	November 1	Preregistration for spring terms begin
Friday	November 16	Thanksgiving recess begins after classes

Sunday	November 25	Residence halls open 1 pm Dining hall opens 5 pm Preregistration for spring ends
Monday	November 26	Classes resume
Friday	November 30	PN fall term ends PN student faculty evaluation period ends
Monday	December 10	Last day of classes for term Student faculty evaluation period ends
Tuesday	December 11	Final exams and presentations week begins
Saturday	December 15	Final exams and presentations week ends Residence halls close 5 pm
Monday	December 17	Final grades posted

2012 WINTER TERM (PN)

Monday	December 3	Classes begin
Friday	December 14	Vacation begins after classes
Monday	January 7	Classes resume
Friday	February 8	Midterm grades posted Deadline for make-up of I grades from fall Vacation begins after classes
Sunday	February 17	Residence halls open 1 pm Dining hall opens 5 pm
Monday	February 18	Classes resume
Tuesday	February 26	Last day to drop with a W (60% pt.)
Monday	March 4	Preregistration for Spring2 begins Student faculty evaluation period begins
Friday	March 15	Preregistration for Spring2 ends
Friday	March 22	Vacation begins after classes
Sunday	March 31	Residence halls open 1 pm Dining hall opens 5 pm
Monday	April 1	Classes resume
Friday	April 12	Winter term ends

2013 SPRING TERM

Sunday	January 6	New student orientation 9 am Residence halls open for new students 9 am Dining hall opens 11 am Residence halls open for return students 1 pm
Monday	January 7	Classes begin Non-matriculated & late student registration begins 8 am
Friday	January 11	Last day to add courses

Friday	February 8	Vacation begins after classes
Sunday	February 17	Residence halls open 1 pm Dining hall opens 5 pm
Monday	February 18	Classes resume
Friday	March 1	Midterm grades posted Deadline for make-up of I grades from fall Graduation applications due
Tuesday	March 12	Preregistration for summer and fall begins
Friday	March 15	Last day to drop with a W (60% pt.)
Monday	March 18	Student faculty evaluation period begins
Friday	March 22	Vacation begins after classes
Sunday	March 31	Residence halls open 1 pm Dining hall opens 5 pm
Monday	April 1	Classes resume
Friday	April 5	Preregistration for fall ends
Thursday	April 11	Honors Convocation 6 pm
Friday	April 26	Last day of classes
Monday	April 29	Final exams begin
Friday	May 3	Final exams end Dining hall closes after lunch Residence halls close 5 pm
Saturday	May 4	Verification of degree candidates
Monday	May 6	Final grades posted
Tuesday	May 14	VAST graduation

2013 SPRING2 (PN)

Monday	April 15	Classes begin
Friday	April 26	Graduation applications due
Friday	May 17	Deadline for I grade from winter term
Monday	May 20	Student faculty evaluation period begins
Thursday	May 23	Last day to drop with a W (60% pt.)
Monday	May 27	Memorial Day: no classes
Thursday	June 20	Spring2 term ends Student faculty evaluation period ends
Saturday	June 22	Commencement 11 am
Monday	June 24	Final grades posted

2013 SUMMER TERM

Monday	May 13	Non-matriculated student registration begins
Tuesday	May 28	First summer classes begin
Friday	June 28	Vacation begins after classes
Monday	July 8	Classes resume
Sunday	July 14	Summer Bridge begins
Friday	August 9	Summer Bridge ends
Monday	August 19-23	Calculus review
Friday	August 23	Summer term ends
Monday	August 26	Final grades posted

General Information

Vermont Technical College is a public, coeducational, two- and four-year technical college with a rural residential main campus located in Randolph Center, Vermont. There is also a commuter campus in Williston with limited residential housing and there are eleven satellite nursing campuses located throughout the state. The college is part of the Vermont State Colleges (VSC) system that includes Castleton State College, Johnson State College, Lyndon State College, and the Community College of Vermont. Vermont Tech offers collegiate-level programs leading to associate degrees with majors in applied technologies and related fields; to bachelor's degrees in Architectural Engineering, Business Technology & Management, Computer Engineering, Construction Management, Dental Hygiene, Diversified Agriculture, Electrical Engineering, Electromechanical Engineering, Equine Studies, Information Technology, Sustainable Design & Technology, Professional Pilot Technology, and Software Engineering; and to a certificate in Practical Nursing.

The college 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, health care, construction, and government. Associate degree programs afford the choice of entering employment upon graduation or continuing toward a bachelor's degree.

Vermont Tech Mission Statement

Vermont Tech is an integral and unique institution within the state of Vermont and the Vermont State Colleges offering career-focused, technical education in specialized areas of study related to agriculture, applied sciences, business, engineering, health science, and sustainability. The college offers bachelor's and associate degrees, certificates, and continuing education.

Vermont Tech prepares students for immediate success and productivity in the workforce, continuing formal education, and life-long 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 Colleges provide affordable, high quality, student-centered, and accessible education, fully integrating professional, liberal, and career study.

This integrated education, in conjunction with applied learning experiences, 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

The Vermont State Colleges also offer numerous opportunities for others to engage in continuous learning to meet their specific goals.

History

In Public Act No. 1 of 1866, the Vermont legislature established the first public school in Vermont devoted to the education of teachers. The Randolph State Normal School served this function until 1910, when the legislature determined that there was a need for a state agricultural school and established the Vermont School of Agriculture at the Normal School site by legislative act, November 29, 1910.

Over the long years of its existence, the Vermont School of Agriculture (VSA) graduated many Vermonters who were distinguished by their numerous and notable contributions to agriculture and government.

In response to evolving educational needs in the state, technical courses were added to the offerings of the school in 1957 and the institution was given a new name reflecting this expanding mission. The Vermont Agricultural and Technical Institute opened on September 9, 1957 as 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 the degree of Associate of Applied Science with a major in the program pursued. The Associate of Engineering degree was first granted in 1965 and the first one-year certificate was awarded in 1986. Another milestone came 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. A second baccalaureate curriculum, the Bachelor of Science in Electromechanical Engineering Technology, began in the fall of 1995 and the Bachelor of Science in Computer Engineering Technology in the fall of 2000. Beginning in 2005, the college offered a Bachelor of Science in either Software Engineering or Information Technology. In June 2007, these additional baccalaureate degrees were added: Dental Hygiene, Equine Studies, and Sustainable Design & Technology. The Bachelor of Science in Electrical Engineering Technology was added in 2011. Professional Pilot Technology was added in 2012.

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 fall of 1996, Practical Nursing became a credit-bearing program that could also be applied toward a two-year associate degree in nursing from Vermont Tech.

Location

Vermont Technical College is located on over 544 acres in Randolph Center, Vermont. Interstate 89 passes within one mile of the campus. Buses from the metropolitan areas serve the area and Amtrak'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 also operates ten nursing campuses throughout the state.

Academic Recognition

By authority conferred by the legislature of the State of Vermont, the Trustees of Vermont State Colleges have authorized Vermont Technical College 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 Technical College has Independent School Approval for grade 12 from the Vermont State Board of Education.

Vermont Technical College 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 Technical College is accredited by the New England Association of Schools and Colleges Commission on Institutions of Higher Education.

The following programs are accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology: Architectural & Building Engineering Technology; Architectural Engineering Technology; Civil & Environmental Engineering Technology; Computer Engineering Technology; Electrical Engineering Technology; Electromechanical Engineering Technology; Mechanical

Engineering Technology. The Engineering Technology Accreditation Commission of the Accreditation Board for Engineering Technology may be contacted at 111 Market Place, Suite 1050, Baltimore, Maryland 21202-4012, telephone (410) 347-7700.

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

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

The Practical Nursing and Associate of Science in Nursing programs are approved by the Vermont State Board of Nursing and accredited by the National League for Nursing Accrediting Commission, Inc. (NLNAC), 3343 Peach Tree Road NE, Suite 500, Atlanta, GA 30326. The Vermont State Board of Nursing may be contacted at the Office of Professional Regulation, National Life Building, North FL2, Montpelier, VT 05620-3402.

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

Vermont Academy of Science and 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. Additionally, because Vermont state law allows VAST students to transfer Vermont Tech credits back to their sending high schools, the students may receive a second high school diploma from that school.

Applications for VAST will be accepted until April 1st and decisions made regarding acceptance into the program by April 15th. Any available seats available after April 15th will be filled on a rolling basis.

Entry into VAST is competitive. Students should have a strong academic transcript and PSAT scores of 55 or higher for each sub-score. VAST students are expected to maintain at least a 2.0 GPA while attending Vermont Tech or they will be required to return to their sending high school. VAST students are also expected to adhere to all policies and procedures outlined in the student handbook.

Upon completion of the one-year program, students may remain at Vermont Tech to complete a degree or transfer to another institution.

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, Vermont. The school has a long history of education, both as a teacher training school and a post-secondary agricultural institution. Today, it is a four-year baccalaureate college offering a wide range of programs leading to bachelor's and associate degrees in technology, agriculture, nursing, allied health, and sustainability.

With four residence halls, two dining facilities, academic buildings equipped with laboratories for numerous technical majors, and conference facilities, Vermont Tech's main campus is equipped to offer the full, traditional college experience as well as acting as an anchor for the wider community and a resource for non-traditional students and lifelong learners.

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. It currently houses all of the college's allied health programs including dental hygiene, nursing, and respiratory therapy. Also available are degree programs in aviation, electrical engineering, computer engineering, electromechanical engineering, and business management. The campus also maintains a Vermont Interactive Television studio and supports a wide array of degree and non-degree workforce-education programs for area businesses.

Putnam/Bennington Campus

The Putnam Memorial School of Practical Nursing was established in 1946 by the Board of Corporators of the Putnam Memorial Hospital. It was the eighth school of practical nursing in the country to be nationally accredited by the National Association for Practical Nurse Education and Service.

The school is on the grounds of the Southwestern Vermont Medical Center in downtown Bennington. All clinical facilities are within walking distance and day care is located in the school building.

Thompson/Brattleboro Campus

Opening in 1907, the Thompson School for Practical Nurses is the oldest continuously operating school for practical nurse education in the United States.

In 1998, the school relocated from a house on Harris Place to its new facilities in the Vermont Agriculture and Business Education center.

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's policy of rolling admissions 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 will be notified promptly of admission status after review of a complete student file. Please note that admission to certain programs is exceptionally competitive and decisions on applicants to these programs are not normally made until the entire applicant pool has been reviewed. Applications are reviewed beginning February 1 for Practical Nursing and Veterinary Technology applicants; February 15 for Respiratory Therapy applicants; beginning March 1 for Dental Hygiene applicants; March 15 for Associate Degree Nursing applicants; and April 1 for VAST applicants. Please call the Office of Admissions to confirm these deadlines.

Admission Deposit

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. After these dates, deposits will be accepted on a space-available basis. The deposit is credited toward the first semester's bill.

SAT/ACT Requirements

All freshman admission candidates are required to take either the SAT I or the ACT. Applicants who are already out of high school are not normally required to take either exam. The College Entrance Examination Board code for Vermont Tech is 3941. The ACT code number is 4323.

First-Year Applicants

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

- Completed application (available online at www.vtc.edu)
- \$44 application fee (payable to Vermont Technical College)
- 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 results

Transfer Applicants

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

- Completed application (available online at www.vtc.edu)
- \$44 application fee (payable to Vermont Technical College)
- Official high school transcript or official scores from a high school equivalency exam (GED)
- Official transcript(s) from all colleges previously attended, whether seeking transfer credit or not

- Official transcript(s) from any other Vermont State College attended prior to the 2002 summer term
- SAT I or ACT results, if available

VAST Applicants

If you are applying to this accelerated high school program, please submit:

- Completed application (available online at www.vtc.edu)
- \$44 application fee (payable to Vermont Technical College)
- 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 scores; Accuplacer scores may be provided in lieu of these tests
- Two letters of recommendation on official letterhead: one from a teacher and one from a guidance counselor or principal
- Personal interview
- Vermont Tech placement test results
- An essay about why you are applying to VAST; discuss: how you think attending the Academy will help you reach your goals; what you can contribute to the Vermont Tech community; a significant event in your life and how it has affected you

Nursing, Allied Health, Respiratory Therapy, & Dental Hygiene Applicants

If you are applying to one of the Allied Health programs, please submit:

- Completed application (available online at www.vtc.edu) (*indicate any locations you would consider attending*)
- \$44 application fee (payable to Vermont Technical College)
- Official high school transcript or official scores from a high school equivalency exam (GED)
- Official transcript(s) from all colleges previously attended, whether 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 health care to patients across the lifespan. Letters from family members cannot be accepted

All Practical Nursing, Nursing, Dental Hygiene, and Respiratory students are required to pass a background check prior to June 1.

(Nursing Only) Prior to start of classes, provide proof of current Health Provider CPR certification.

(Nursing Only) If returning to complete a Practical Nursing program after a year, 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 he or she will not be readmitted to the program. Students who have been out of the program for more than a year must repeat all nursing clinical courses in the program.

(Respiratory Only) 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, he or she will not be 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.

Additional Requirements for Associate Degree in Nursing

- A copy of your current LPN license (without any sanctions/restrictions)
- If you are a graduate of a non-college PN program or a graduate of a Vermont LPN program prior to 1997, you must show completion of college-level equivalency for: Anatomy & Physiology (8 credits); Nutrition (3 credits); and Concepts of Human Growth & Development (3 credits)
- If you are a graduate of a non-college PN program, you must submit your PN program transcript
- Proof that you have passed the PN National Council Licensure Exam (NCLEX-PN)
- If a current PN student, you must attain a first semester GPA of 3.2 or higher. If a LPN graduate, you must have a GPA of 3.0 in your LPN coursework. BIO 2120, ENG 1061, MATH 1040, PSY 1010, and an approved Arts/Humanities elective may be taken after LPN graduation to improve your GPA to a 3.0 level
- If you are a LPN, you must submit two signed recommendations on letterhead that address your clinical competence; work ethic; potential transition to an RN role, particularly with respect to leadership, management, and accountability; and interpersonal skills
- Current PN students must have submitted a Summary of Clinical Performance document. This document must be completed by each clinical faculty member.

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.

Professional Pilot Technology Applicants

Professional Pilot Technology applicants are required to write a short essay (maximum 1,000 words) to accompany their application. The subject is “Why I Want to be a Pilot” or similar.

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.

	CT	MA	ME	NH	RI
Agribusiness Management	◇	◇			◇
Architectural/Building (2 year)		◇			◇
Architectural/Engineering (4 year)	◇		◇	◇	◇
Automotive Technology	◇	◇	◇		◇
Business Tech & Management (2 year)	◇	◇	◇	◇	
Business Tech & Management (4 year)			◇	◇	
Civil/Environmental Engineering (2 year)					◇
Computer Engineering (2 year)			◇		
Computer Engineering (4 year)	◇		◇		◇
Construction Management (2 year)	◇	◇			◇
Construction Management (4 year)		◇		◇	◇

	CT	MA	ME	NH	RI
Dairy Farm Management		◇	◇		◇
Dental Hygiene	◇	◇		◇	◇
Diesel Power Technology	◇				◇
Diversified Agriculture		◇	◇		◇
Electrical Engineering (2 year)	◇		◇		◇
Electrical Engineering (4 year)					
Electromechanical Engineering	◇	◇	◇	◇	◇
Equine Studies	◇				◇
Fire Science	◇				
Information Technology (AS)			◇		◇
Landscape Development & Horticulture		◇			◇
Licensed Practical Nursing	◇	◇	◇	◇	◇
Mechanical Engineering		◇			
Professional Pilot Technology	◇		◇	◇	◇
Software Engineering (AS)		◇	◇	◇	◇
Sustainable Design & Technology		◇	◇	◇	◇
Veterinary Technology					◇

New York Residents' Good Neighbor Policy

Reduced tuition rates are available for residents of the state of New York. Please contact Admissions to see if you are eligible.

Definition of a Vermont Resident

The following criteria must be met by a student prior to being granted resident status for the purpose of admission, tuition, and other Vermont Tech charges.

- The applicant shall be domiciled in Vermont, said domicile having been continuous for one year immediately prior to the date of application unless the student has been in the armed services, Peace Corps, or other recognized national service organization and has retained Vermont as his/her permanent address during the period of absence and has returned to Vermont immediately following discharge from these services. Changes in residency status shall become effective for the semester following the date of reclassification.
- Domicile shall mean a person's true, fixed, and permanent home, to which he or she intends to return when absent. A residence established for the purpose of attending an educational institution or qualifying for resident status for tuition purposes shall not of itself constitute domicile. Domicile shall not be dependent upon the applicant's marital status.
- The applicant must demonstrate such attachment to the community as would be typical of a permanent resident of his or her age and education.
- Receipt of significant financial support from the applicant's family will create a rebuttable presumption that the applicant's domicile is with his or her family
- An applicant becoming a student at an institution of higher learning in Vermont within one year of first moving to the state shall have created a rebuttable presumption of

- residence in Vermont for the purpose of attending an educational institution.
- A student eligible for tuition purposes to enroll as a resident student in another state shall not be enrolled as a Vermont resident.
- A student enrolled at Vermont Technical College shall be classified by the college's Admissions office as a resident or non-resident for tuition purposes. The decision by the officer shall be based upon information furnished by the student and other relevant information. The officer is authorized to require such written documents, affidavits, verifications, or other evidence that he or she deems necessary
- The burden of proof shall, in all cases, rest upon the student claiming to be a Vermont resident and shall be met upon a presentation of clear and concurring evidence.
- A student with resident status will lose that status if he or she fails to meet the above requirements at any time. In this event, resident tuition and other charges shall continue in effect only until the end of the academic year.
- The decision of Admissions on the classification of a student as a resident or non-resident may be appealed in writing to the college's Dean of Administration.

Further appeal of a student's residency classification may be made in writing to the Chancellor of the Vermont State Colleges. The decision of the Chancellor shall be final.

Dual Enrollment

Across the country, high school students are taking advantage of dual enrollment opportunities. 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, the regional technical center, and/or the 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 his/her 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 will 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.

International Students

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

- Completed application (available online at www.vtc.edu)
- \$44 application fee (payable to Vermont Technical College)
- 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
- Official Testing of English as a Foreign Language (TOEFL) scores (if English is a second language). The minimum score required on the TOEFL test is 500 for the paper test, 173 for the computer based test, and 61 for the internet-based test
- 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

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 will issue your I-20. The \$300 will be 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, he or she will be required to 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 will benefit from structured time at the Writing and Communication Centers. 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

Program Prerequisites

Program	Degree	Prerequisite
Agribusiness Management Technology	AAS	algebra I; algebra II ^o ; lab science (chemistry preferred)
Architectural & Building Engineering Architectural Engineering Technology	AAS, BS	algebra I & II; geometry; lab physics [†] or chemistry
Automotive Technology	AAS	algebra I; geometry; algebra II ^o ; lab physics or chemistry ^o
Business Technology & Management	AAS, BS	algebra I; algebra II ^o
Civil & Environmental Engineering	AE	algebra I & II; geometry; lab physics or lab chemistry
Computer Engineering Technology	AE, BS	algebra I & II; geometry; lab physics [†] or chemistry
Computer Information Technology	AS, BS	algebra I & II; geometry; lab physics or chemistry
Computer Software Engineering	AS, BS	algebra I; algebra II; geometry; lab physics or chemistry
Construction Management	AAS, BS	algebra I; geometry; algebra II ^o ; lab physics or chemistry ^o
Dairy Farm Management Technology	AAS, BS	algebra I; algebra II ^o ; 2 years of science (chemistry preferred)
Diversified Agriculture	BS	algebra I & II; geometry; lab physics or chemistry
Dental Hygiene**	AS, BS	algebra I & II; geometry; lab biology; lab chemistry; 2 letters of recommendation; freshman level English placement; criminal background check
Diesel Power Technology	AAS	algebra I; geometry; algebra II ^o ; lab physics or chemistry ^o
Electrical Engineering Technology	AE, BS	algebra I & II; geometry; lab physics [†] or chemistry
Electromechanical Engineering	BS	completion of VTC's AE program in EET, MEC, or equivalent
Equine Studies	BS	algebra I; algebra II ^o ; biology; lab chemistry

Program	Degree	Prerequisite
Fire Science	AAS	algebra I; geometry; algebra II ^o ; lab physics or chemistry ^o
General Engineering	AAS	algebra I & II; geometry; lab physics [†] or chemistry
Landscape Design/Sustainable Horticulture	AAS	algebra I; algebra II ^o ; two years of science (lab course [†])
Mechanical Engineering Technology	AE	algebra I & II; geometry; lab physics [†] or chemistry
Nursing**	AS	LPN licensure with 3.2 minimum GPA after first semester and 3.0 GPA in LPN coursework or equivalent; minimum Accuplacer scores of 70 for arithmetic and 40 for algebra; freshman level English placement; 2 letters of recommendation or Summary of Clinical Performance documents; high school-level lab chemistry or college-level microbiology; criminal background check
Practical Nursing**	C	minimum of high school level chemistry, biology, and algebra I (within last 10 years); minimum Accuplacer scores of 70 for arithmetic and 40 for algebra; freshman level English placement; 2 letters of recommendation; criminal background check; Bennington and Brattleboro students must take A&P I and II and Nutrition as prerequisites; Extended site students must take these as well as Human Growth & Development
Professional Pilot Technology	BS	algebra I & II; geometry; lab physics or chemistry
Respiratory Therapy**	AS	minimum of high school level chemistry, biology, and algebra I (within last 10 years); minimum Accuplacer scores of 70 for arithmetic and 50 for algebra; freshman level English placement; 2 letters of recommendation; criminal background check
Sustainable Design and Technology	BS	acceptance or a degree in architecture, civil engineering, electrical/mechanical engineering, landscape/horticulture, or dairy farm management; department recommendation
Telecommunications Technology*	AAS	algebra I; algebra II; geometry; lab physics or chemistry
Veterinary Technology**	AAS	algebra I; algebra II; biology; lab chemistry

AAS: Associate of Applied Science

AE: Associate of Engineering

AS: Associate of Science

BS: Bachelor of Science

C: Certificate Program

* *Industry-sponsored program offered at the facilities of sponsoring organizations; contact Continuing Education & Workforce Development with questions*

** *Apply early; admission competitive*

[†] *Preferred course*

^o *Recommended course*

Placement Testing

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

Students who have completed bachelor's degrees at regionally accredited US colleges or universities or have met the English and mathematics program requirements may be exempted.

If a student's skills are below minimum levels, he or she will be required to take developmental courses in the appropriate areas. This would result in additional coursework and a longer overall enrollment period.

A student has the right to appeal the results of the placement test by contacting the Office of the Academic Dean. Students with disabilities should contact a Learning Skills Specialist to discuss possible test accommodations.

Students who place into a three-year mathematics or English sequence may still be accepted into programs that do not offer the three-year option. These students may require an additional year to complete their associate degree requirements.

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 math and English.

Student Registration Schedules/Class Listings

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

All of the Vermont Tech terms start with the letter "T". For example, *T12FA* translates to the fall 2012 term at Vermont Tech.

First-year students are registered by Registrar staff after placement testing results and prior credit information are received and the tuition deposit is paid. 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.

Non-Degree Students

Non-degree students may register two weeks prior to the start of the term. Students who wish to enroll for course work 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 Registrar's Office. There is no online registration for non-degree students nor are they eligible for federal financial aid.

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.

There is a \$25 fee for evaluation of transcripts outside of the VSC. This evaluation is normally completed after the student's acceptance of the offer of admission and the fee is billed to the student's account. Early transcript evaluation can be made for applicants who pay the evaluation fee in advance.

Generally, credit for applicable college courses taken may be granted for those courses completed with a grade of C- or better or C for any science course required for PN, ADN, DHY, or RSP; however, the transferred grades will not be computed into a student's GPA.

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 of subject material. Vermont Tech will be 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 selected; 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 regionally 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 Registrar's Office 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.

Summer Programs

Vermont Tech offers a number of summer courses which usually include calculus, technical communication, ESOL, and a few other general education offerings. There is also an intensive, four-week summer bridge program. This is a preparatory program in math, physics, computers, and English.

Academic Affairs

Orientation

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

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 them 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 their advisor, they should contact the Registrar's Office.

Attendance/Assignment Requirements

Students are expected to meet the attendance/assignment requirements set by each instructor for each class in which they are enrolled. Failure to meet attendance/assignment 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, students may be dismissed from the college with failing grades.

The make-up of any work missed for any reason will be at the discretion of the instructor. Any time a student misses a class, exam, laboratory, 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.

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 calculated 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	<i>Failure</i>	0.0
P	<i>Pass</i>	0.0
NP	<i>No Pass</i>	0.0
I	<i>Incomplete</i>	0.0
AU	<i>Audit</i>	0.0
W	<i>Withdrawn</i>	0.0
CR	<i>Credit Received (Challenge, AP, CLEP, etc.)</i>	0.0
TR	<i>Transfer Credit Received</i>	0.0

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

Transcripts

Credits earned within the VSC system are not considered transfer credit. All VSC courses taken starting in the 2002 summer term will be 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 his or her record to any school, employer, or other agency. For each transcript, students must submit a written, signed request to the registrar's office. A transcript fee will be charged. Transcripts will be 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 will not be sent for a student who has not satisfied financial obligations with the college.

Grade Amelioration Policy

One time in an academic career, a student who is changing programs or VSC schools may, with proper approval, have selected grades excluded from the calculation of his or her cumulative GPA in the new academic program. Grades may only be excluded for courses required in the old program that are 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

Auditing Courses

Tuition charges for an audit course will be 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 will not be applied to student credit load or status.

Instructors, in giving permission for an audit, will specify the expectations for students participating as an auditor. Students who successfully audit a course will receive an AU grade, which carries no credit or quality points. Students who do not meet expectations of the audit will be 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 will be determined by the quality of the make-up work and the previously completed work. If the student fails to complete the assigned work, the instructor will determine a default grade that will be 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 will be 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 will appear on the record and the most recent earned grade will be used in computing the cumulative GPA.

The English, mathematics, engineering technologies, and physics departments all have courses that have been created for students pursuing the Engineering Technology Foundations Track. If a student who has taken a course designed for the Engineering Foundations repeats the equivalent course(s) in the two-year format, or vice-versa, the more recent grades and credit will be substituted in computing the 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. During the second week, degree students may drop with the advisor's 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 will 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 will be dropped from the roster and will receive no grade
- After the normal add/drop period and until the 60% point of a course will receive a grade of "W"
- 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
- After the 60% point or who fail to drop the course will receive an earned grade whether they attend the remaining classes or not. Students who fail to drop a course are also responsible for costs incurred

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

Students who drop courses after the first two weeks of class will not be reimbursed unless they withdraw from all their courses for the term. Students may not drop physics or math courses in the Engineering Foundations Track without the approval of the Academic Dean.

Withdrawal from Vermont Tech

To withdraw from Vermont Tech once the term has started, a student must give written notification to the registrar's office or off-campus site office. A parent or guardian must approve withdrawal requests made by minors. A student who stops attending classes after add/drop and does not inform the college will be considered to have withdrawn after the 60% point of the term if the last date of an academically related event cannot be determined.

Students will receive grades based on the guidelines specified in *Dropping a Course*.

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 registrar's office or off-campus site office
- Complete an exit interview with the financial aid office

Leave of Absence

To take a leave of absence once the term has started, a student must request the leave in writing through the registrar's office or off-campus site office. A parent or guardian must request leave for a minor. Leave requires approval from the academic dean.

If the request is for a medical leave of absence, a letter from the student's health practitioner may be 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.

For a leave of absence to be approved, it is expected that incomplete coursework can be satisfactorily completed upon a student's return and prior to the end of the subsequent term.

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

Grades for students on approved leaves of absence will be in accordance with the

guidelines specified in *Dropping a Course*, with the exception that I or W grades may be used after the 60% point until the end of the leave of absence. College policy will be followed for students required by the college to take a mandatory leave of absence.

Credit by Challenge Examination

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

Documentation must be submitted to the department chairperson at least three weeks prior to the planned date of testing. After review and acceptance by the chairperson, 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 course work must comply with all of the above criteria and must document new course work, 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 will not be approved for a term credit overload. Students with overloads will be 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, academic probation, and academic dismissal.

Good Standing

Degree students are in good standing if they meet the enrollment criteria for the term and have a cumulative GPA of 2.0 or better (1.75 for students with less than 30 GPA credits).

Academic Probation

Degree students will be placed on academic probation if they have a cumulative GPA below that required for good standing.

Probation is not a punitive measure, but rather 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 1 term for:

- Receiving a term or cumulative GPA below .70
- Not achieving good standing while on probation (on probation for more than 1 semester)

Students may also be dismissed from individual classes at any time when the instructor and/or Academic Dean determine(s) that continued enrollment is not appropriate, *e.g.* violation of cheating or plagiarism policy; nonattendance; inappropriate behavior, failure to complete assigned work, etc.

Students dismissed during the term will receive grades of F or NP in any incomplete course.

Students who are dismissed may not enroll in any Vermont Tech course for a minimum of one term. This applies to consortium enrollment from other VSC institutions as well. Students returning from academic dismissal will be on probation for a minimum of one term and must enroll in and pass the Effective Learning course.

Appeal of Academic Dismissal

A student who believes that there are significant mitigating circumstances shall submit a letter to:

Academic Appeals Committee (AAC)
c/o Vermont Technical College
PO Box 500
Randolph Center, VT 05061

This letter will include the student's full name, address, and college identification number. It will fully explain the circumstances surrounding the appeal. The AAC will meet and make a recommendation to the Academic Dean, who will make a final decision regarding the appeal. This decision will be final and will not be subject to further appeal. To read about this process more fully, please see the *Vermont Technical College Student Handbook*.

Students reinstated on appeal will normally be reinstated on academic probation. Students 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 readmission through the admissions office after they have met the conditions set for them at the time of dismissal. Readmission 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 Vermont Tech Office of Admissions and inform them of their intention to return to Vermont Tech. Admissions will advise the student whether they need to complete a new application or whether they can preregister for the upcoming semester with the registrar's office. This determination is based on length of absence, program requirements, and other academic considerations.

Returning after Dismissal

Students who have been dismissed from Vermont Technical College may return to Vermont Tech under the following conditions:

- Students have met the requirements placed upon them at the time of dismissal
- Students notify admissions in writing of their intent to return to Vermont Tech
- Students are approved for re-admission by the Office of Admissions

Upon receiving notification from admissions, the department chair or program coordinator will determine whether a fall or spring re-admission is most appropriate and will send a preregistration to admissions outlining course work and/or suggested course work prior to re-admission. Admissions will forward returning student information to the registrar's office, student housing, and financial aid.

Returning students desiring financial aid will have to appeal to the Office of Financial Aid to have their aid reinstated. A new housing contract will need to be completed if the student wishes to live on campus. After returning, students will be on probation and will receive increased supervision and academic support for a minimum of one semester. Students will also be required to enroll in and pass the Effective Learning course.

Changing Programs

If a student wishes to change programs, he or she must petition through the registrar's office and be approved by the appropriate department chairperson.

Dual or Multiple Majors

If a student wishes to receive credit for a second degree or major, he or she must petition through the registrar's office. If approved, the student must successfully complete at least 15 credit hours for an associate degree or 30 credit hours for a bachelor's degree of course work beyond the first major for each successive major. This course work will include all courses required in the successive major(s) that are not required in the first.

Regular course schedules are optimized for students with one program and major taking a full course load. Because of this, dual majors typically require a minimum of an extra year at Vermont Tech.

All students with multiple majors will be awarded one degree with the additional majors annotated on his or her diploma.

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 will be required to demonstrate competence in these disciplines at the appropriate level for their degree program. Students will 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 Dean of Academic Affairs

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

Graduation Requirements

- Have a 2.00 cumulative GPA
- Complete 30 of the last 39 credits at Vermont Tech or 15 credits minimum for programs of less than two years
- Complete at least 50% of the coursework at Vermont Tech or 15 credits minimum for programs of less than two years
- Complete 60 credits minimum for an associate degree, 64 for ABET programs
- Complete 120 credits minimum for a bachelor's degree
- Satisfy all financial obligations to Vermont Tech
- Apply for graduation

The department chairperson will 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 will be assigned the requirements for the catalog that is in effect for the year of their return. These students will be 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.

Students who successfully complete all graduation requirements and are recommended by their departments will graduate and receive a diploma.

Students who are within 7 credits of the graduation requirements, have applied to walk

or graduate on their application, and have the recommendation of their department may participate as walkers. 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. Walkers who subsequently complete their degree requirements must apply for a diploma that will be mailed after approval and the next commencement. Walkers have one year to meet the specified requirements.

Term Honors

At the end of each term, degree students who have attained the following term GPA 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 will be accorded academic honors:

3.5 Dean's List

4.0 President's List

There is one exception to the above: 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:

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:

- 3.5 cumulative GPA with no incomplete grades
- Sophomore status
- Must be working toward an associate degree with a minimum of 12 credits completed at Vermont Tech

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:

- Cumulative GPA of 3.5 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 3.3 or better cumulative GPA.

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.

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:

<i>Cum Laude</i>	3.5
<i>Magna Cum Laude</i>	3.7
<i>Summa Cum Laude</i>	3.9

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

- Complete 50% of the degree requirements within the VSC system
- Have achieved the following cumulative GPA for all coursework:

3.0	<i>Honors</i>
3.5	<i>High Honors</i>

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 Awards* is given to the graduating senior with the highest academic average and greatest all-around academic development in the Civil and 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 a Bachelor of Science in Architectural Engineering Technology program. 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 Business Technology & Management Faculty Awards* are given to graduating seniors for the highest academic average and greatest all-around academic development in this program.
- *The Computer Engineering Technology Awards* are given to graduating seniors with the highest academic average and greatest all-around academic development in this program
- *The Dental Hygiene Peer Recognition Award* is given to a second-year dental hygiene student who, in the opinion of his/her fellow classmates, exhibits the interest, attitude, and cooperative spirit desirable in a dental hygienist. This award will be given out at the pinning ceremony on graduation day.
- *The Dorothy Wootton Outstanding Clinician Award* is given to the graduating student who best demonstrates outstanding clinical performance from the faculty of the Department of Dental Hygiene.
- *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 senior who has shown the greatest all-around academic development in an agricultural technology program.

- *The Faculty Award* is given to the graduating student who has made the greatest contribution to student activities while attending Vermont Tech.
- *The Institute of Electrical and Electronics Engineers Awards* are given to graduating seniors with the highest academic average and greatest all-around academic development in the Electrical Engineering Technology program.
- *The Lambda Beta Society* is a national honor society for the profession of respiratory care and students are proposed for membership if they are in the final semester of the Respiratory Therapy program and rank in the top 25% of the graduating class.
- *The Landscape Development & Ornamental Horticulture Faculty Awards* are given to the graduating seniors with the highest academic average and greatest all-around academic development in this program.
- The Practical Nursing program recognizes clinical excellence through academic awards that are specific to the individual PN nursing campuses. Graduation awards are given at the Putnam Campus, Thompson Campus, Williston Campus and at the Randolph Center Campus. Additional awards are also awarded under the college's extended campus designation.
- *The Nursing Program Awards* are 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 Paul Calter Scholarship Award* is given to the student who, in the opinion of the mathematics faculty, has shown the best performance in the regular mathematics sequence (MAT 1420 and MAT 1520) for the last year.
- *The Respiratory Therapy Program Award* is given to a graduate of the associate of science degree for academic excellence.
- *The Robert S. Brady Memorial Award* is given to the graduating senior who has shown the greatest all-around academic development in the Architectural and Building Engineering Technology program from the Vermont Chapter of the American Institute of Architects.
- *The Ruth Freeman Memorial Award* is given to the graduating senior with the highest academic average in the Architectural and Building Engineering Technology program from the Vermont Chapter of the American Institute of Architects.
- *The Rutland County Alumni Award* is given to the graduating senior who is a Rutland County resident with the highest academic average.
- *Sigma Phi Alpha Dental Hygiene Honor Society* was organized to recognize, promote, and honor outstanding scholarship, service, and character among students or graduates of dental hygiene schools in the US and Canada. Second-year dental hygiene students who rank highest in scholarship and character and who exhibit potential qualities 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.
- *The Society of Manufacturing Engineers, Twin States Chapter 40, Award* is given to graduating seniors with the highest academic average and greatest all-around academic development in the Mechanical Engineering Technology program.
- *The Stanley G. Judd Memorial Fund Award* is given to the graduating senior with the highest academic average in an agricultural technology program from the Vermont Tech Alumni Association.
- *The Student Engineering Technician of the Year Award* is given to a senior who is

selected from nominations by the engineering technology departments for outstanding scholarship, character, and leadership.

- *The Vermont Association of Professional Horticulturists Student Award* is given to a second-year student in the Landscape Development and Ornamental Horticulture Program who exemplifies the qualities of a professional in their 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 Awards* are given to graduating seniors with the highest academic average and greatest all-around academic development in the Automotive Technology program.
- *The Vermont Dental Hygienists Association Membership Spirit Award* is given to the graduating Dental Hygiene student who exhibits a high level of professional pride and enthusiasm for the profession of dental hygiene.
- *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 and 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 laboratory performance and a positive general attitude as shown by class and/or laboratory participation and/or 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 and Ethics

Vermont Tech expects high standards of truthfulness and honesty in all academic work. Any student who is found guilty of academic dishonesty will face 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, and/or assignments.

Center for Academic Success

The staff and programs at the Center for Academic Success (CAS) provides students with assistance to reach their full potential and be successful while attending Vermont Tech. This assistance includes both the academic and personal support necessary to meet academic, personal, and career goals: tutoring,; short-term counseling and goal-setting; study and test-taking assistance; and financial literacy information and assistance. The TRIO Student Support Services 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 as well. Students enrolled at other sites can contact their site coordinator or the main CAS office to arrange for services which are delivered through several methods: phone, Skype, or in person.

Academic Counseling

Academic counseling includes a variety of services designed to help students with concerns about reaching their academic goals. Counselors provide informal academic assessments, academic and vocational counseling, and individual help with writing and study skills. Referrals for individual tutoring with professionals in specific courses are also available.

Assistive Technology

The CAS provides access to a variety of assistive technology software programs and hardware designed to help students with such things as scanning, editing, or dictating documents; having documents read aloud by the computer for editing or test-taking; and developing or organizing information.

Career/Transfer Center

The Career/Transfer Center provides assistance with career and college transfer decision-making and job placement; occupational information; college information; and individual assistance and workshops on writing resumes, job hunting strategies, internships, and job interviews. Vermont Tech maintains close ties to industries through field trips, an annual career fair, mentoring, and guest speakers. Spring is a busy recruiting season on campus.

Services for Students with Disabilities

Prior to enrollment, students with any type of disability are encouraged to identify their disability to the Learning Skills Specialist to arrange necessary accommodations. Incoming Vermont Tech students with pre-existing mental illness should consider contacting the Learning Skills Specialist to discuss potential residential or academic accommodations.

Interviews and phone calls to address particular concerns are welcome at any time during the admissions process and while attending Vermont Tech. All information regarding a disability is kept in strict confidence and is never entered on a student's academic record.

Available services include: academic counseling; student support group; classroom accommodations; 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; cultural events; field trips; information on financial literacy; and help with financial aid forms and issues.

Support and Counseling

The Center for Academic Success focuses on wellness for emotional and mental health. The center offers workshops, mentoring, and support groups on stress, adjusting to college, academic success, test anxiety, and other issues related to student wellness. The center also offers referrals to off-campus mental health agencies where appropriate. Students with specific mental health concerns may work with the counselor at the CAS or may contact the Dean of Students for assistance locating appropriate community treatment resources.

The Tutoring Center

The Tutoring Center provides a wide range of academic services, including tutoring by appointment, evening walk-in tutoring, test review sessions, study groups, and writing assistance with papers at any point in the writing process, as well as lab reports and projects. ESOL computer programs are also available to students that allow practice with vocabulary, pronunciation, and grammar. All tutoring services are free of charge and there is no limit on the number of hours tutoring can be accessed. It is available for most courses and to any student hoping to do better in terms of grades or comprehension of content.

Hartness Library

Located in the heart of the Vermont Tech campus, the library provides a friendly and helpful environment to study, complete projects, or meet with other students. Library staff members are here to help students find the information needed to get their work done. In addition to books, newspapers, and journals, the library has DVDs, books on CD, and course reserve materials. Through the library's website, students can access thousands of full-text periodicals, ebooks, and reference from any location. For more information, go to <http://hartness.vsc.edu>

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; mail 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 in the Registrar's Office. 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, and Right-to-Know

Annually, Vermont Tech informs students of FERPA. 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 Registrar's Office.

VSC Enrollment Consortium Agreement

By agreement of the five Vermont State Colleges (Castleton, Lyndon, Johnson, Vermont Tech, and the Community College of Vermont), 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 course work will meet program requirements at the home institution prior to enrolling at the other VSC institution. Registration for courses at other VSC institutions will be 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 will 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 will be taken.

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

Students who desire to enroll exclusively at another VSC school other than their home institution may do so for a maximum of two terms. To be eligible for this, students 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 will be included in GPA calculations at the home institution.

Tuition & Fees 2012-2013

Estimated Costs of Attendance

Students are responsible for familiarizing themselves with the costs 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 programs except Nursing, Dental Hygiene, & Aviation

	Vermont	Residents	Non-VT	Residents	RSP/NEBHE	Program
	Term	Year	Term	Year	Term	Year
Tuition	\$5,544	\$11,088	\$10,596	\$21,192	\$8,328	\$16,656
Double Room****	2,616	5,232	2,616	5,232	2,616	5,232
Board (Gold plan)	1,777	3,554	1,777	3,554	1,777	3,554
Student Activity Fee	118	236	118	236	118	236
Facilities Fee*	350	700	350	700	350	700
Matriculation Fee**	320	320	320	320	320	320
Health Insurance***	1,403	2,133	1,403	2,133	1,403	2,133
Total	\$12,128	\$23,263	\$17,180	\$33,367	\$14,912	\$28,831

* Applies to all matriculated students.

** New students only; incoming rate is \$320; one-time charge for first semester enrolled

*** Required if not covered by another medical plan; you must be a full-time, degree seeking student to obtain coverage. The one-semester rate of \$1,403 applies to spring semester incoming students only. \$2,133 is the annual rate for all fall semester students.

**** Room charges for Randolph Center campus, see Other Estimated Expenses for Williston campus

Other Estimated Expenses

	per term	per year
Books, transportation, personal needs	\$1,325	\$2,650
Automotive student tools		2,200
Equine riding arena costs		1,200
Williston campus room (no meal plan)		6,626

Cost Chart Two: Nursing

		Associate Degree Nursing (2 Semesters)			Practical Nursing (3 Semesters)	
	Vermont Residents	Non-VT Residents	RSP/NEBHE Program	Vermont Residents	Non-VT Residents	RSP/NEBHE Program
Tuition	\$11,640	\$21,720	\$17,184	\$16,005	\$29,865	\$23,628
Double Room****	5,232	5,232	5,232	6,432	6,432	6,432
Board (Gold plan)	3,554	3,554	3,554	4,739	4,739	4,739
Student Activity Fee	236	236	236	326	326	326
Facilities Fee*	700	700	700	961	961	961
Matriculation Fee**	320	320	320	320	320	320
Health Insurance***	2,133	2,133	2,133	2,133	2,133	2,133
Total	\$23,815	\$33,895	\$29,359	\$30,916	\$44,776	\$38,539
Total Off-Campus	\$15,029	\$25,109	\$20,573	\$19,745	\$33,605	\$27,368
Room/Board	\$8,786	\$8,786	\$8,786	\$11,171	\$11,171	\$11,171

* Applies to all matriculated students

** New students only; cost is fall semester rate

*** Required for all full-time students not covered by another medical plan

**** Room charges for Randolph Center campus; see Other Estimated Expenses for Williston campus

Other Estimated Expenses

	per term	per year
Books, transportation, personal needs	\$1,325	\$2,650
Nursing uniforms		250
Williston campus room (no meal plan)		non-PN: 6,626 PN: 8,835

For further information concerning estimated costs of attendance for the Nursing programs, contact the Business Office at 1-802-728-1301. 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	\$6,936	\$13,872	\$10,596	\$21,192	\$8,328	\$16,656
Williston Room*	3,313	6,626	3,313	6,626	3,313	6,626
Student Activity Fee	118	236	118	236	118	236
Facilities Fee**	350	700	350	700	350	700
Matriculation Fee***	320	320	320	320	320	320
Health Insurance****	1,403	2,133	1,403	2,133	1,403	2,133
Total	\$12,440	\$23,887	\$16,100	\$31,207	\$13,832	\$26,671

*Williston based on availability; no meal plans available at Williston campus

**Applies to all matriculated students

*** New students only; incoming rate is \$320

**** Required if not covered by another medical plan; you must be a full-time degree seeking student to obtain coverage. The one-semester rate of \$1,403 applies to spring semester incoming students only. \$2,133 is the annual rate for all fall semester students.

Other Estimated Expenses

	per term	per year
Books, transportation, personal needs	\$1,325	\$2,650
Clinic attire, uniforms, shoes, laundry, etc.		1,200
Second-year exams & licensure		1,400
	first year	second year
Dental instruments & lab materials	\$1,700	\$1,200

Cost Chart Four: Professional Pilot Technology

In addition to Tuition and other Fees, the Professional Pilot Technology program requires Flight Fees specific to mandated flight time in the aircraft and flight simulator for each of the FAA certificates and ratings.

Flight fees are applied to individual flight courses and are charged prior to 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 will be billed on an hourly basis until successful completion is reached. Any left-over funds for a course due to a student completing everything in the minimum FAA required times, may be either refunded or rolled over to the next flight fee course.

A full breakdown of all ground, flight, pre & post briefings, and simulator instruction is available as a handout and will be posted on the web.

If a student chooses not to take the Multi-Engine rating and the two additional Certified Flight Instructor ratings (Instrument and Multi-Engine), s/he may take an appropriate 3 credit elective to replace the three 1 credit courses and not obtain the last 3 ratings during the senior year.

Flight Fees for 2012-2013

Private	\$10,824
Instrument	10,835
Commercial I	15,940
Commercial II	14,353
CFI: Airplane	6,105
CFI: Instrument	1,578
CFI: Multi-Engine	3,776
Multi-Engine (L & S)	6,618

Other Estimated Expenses

FAA Medical Examination: A FAA 1st Class medical exam must be completed by an authorized Aviation Medical Examiner prior to a student's first flight training. Estimated medical expense is presently **\$125**; students may not need any additional medical during the degree program.

Drug & Alcohol Screening: A mandatory drug and alcohol screening is required of all aviation enterprises and airlines. Students must complete a screening prior to commencing flight training and if/when randomly chosen at any time during the four-year program. Estimated expenses are **\$100** for initial screening and if/when chosen for a random test, each will be between **\$30-60**.

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 CATS Testing Center, as required by the FAA. Vermont Flight Academy operates a full CATS Testing Center at the airport.

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 Flight 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. The present fee is **\$400** per check ride.

Pilot Equipment: Headsets, Federal Aviation Regulations, aviation charts, plotters, E6-B flight computers, aircraft syllabus/course books, flight logbook, oral & practical test prep guides, FAA Practical Test Standards for each course, etc. A list of all required materials will be handed out and posted on the web-site. Textbooks for non-flight aviation courses are not included. Estimated costs for the four-year program is **\$1,500 - 1,800**.

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 highly recommended that each student purchase an individual non-owner policy for **\$162** per year. This provides student liability protection for legal defense, deductible & 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, a collared shirt will be required, either short or long-sleeved.

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

Optional Room & Board Rates per Semester (Randolph Center campus only)

Double Room	\$2,616
Single Room	3,313
Triple Room	2,349
Gold Meal Plan (<i>unlimited with 75 pts. at snack bar</i>)	1,777
12 Meal Plan (+150 points at snack bar)	1,710
8 Meal Plan (+225 points at snack bar)	1,644
150 Block Meal Plan (+150 points at snack bar)	1,710
Overnight rooms for emergencies (<i>per night</i>)	20

Other Fees: All Programs

Application fee (<i>due when applying for admission</i>)	\$44
Course Change	20
Challenge Exam Fee	100
Deferred Payment Fee	50
Graduation Fee	82
Late Class Registration	54
Late Financial Clearance Fee	100
Non-degree Student Registration Fee (<i>per semester</i>)	50
Returned Check Fee	25
Parking Sticker	fall: 60 spring: 30
Portfolio Assessment	50
Transcript Evaluation (<i>incoming transfer courses</i>)	50
Transcript Fee (<i>per copy</i>)	5

Per Credit Tuition and Fees

Degree-seeking students registered for 12 credit hours or more are full-time students and expenses are set forth under cost charts One through Three 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 (<i>non-Dental Hygiene, non-Nursing</i>)	\$462
Vermont Resident (<i>Nursing</i>)	485
Vermont Resident (<i>Dental Hygiene</i>)	578
Non-Vermont Resident (<i>non-Nursing</i>)	883
Non-Vermont Resident (<i>Nursing</i>)	905
RSP/NEBHE (<i>non-Nursing</i>)	694
RSP/NEBHE (<i>Nursing</i>)	716

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

Fees

Student Activity Fee (<i>per credit hour, max. 12 credits</i>)	\$10
Non-degree Student Registration Fee (<i>per semester</i>)	50
Facilities Fee* (<i>per credit hour, max. 12 credits</i>)	29
Summer Student Activity Fee	0

*All Matriculated Students

Summer Costs 2013

Vermont Resident (<i>non-Dental Hygiene, non-Nursing</i>)	\$462
Vermont Resident (<i>Nursing</i>)	485
Vermont Resident (<i>Dental Hygiene</i>)	578
Non-Vermont Resident (<i>non-Nursing</i>)	694
Non-Vermont Resident (<i>Nursing</i>)	716
RSP/NEBHE (<i>non-Nursing</i>)	694
RSP/NEBHE (<i>Nursing</i>)	716

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

Senior Citizen Discount

Non-degree-seeking Vermont citizens age 65 and over will be given a 100% reduction on their tuition costs.

Explanation of Fees

Application Fee: \$44

This fee is required when a prospective student applies for admission to the college.

Board

Students may choose from three meal plans. The *Gold Plan* offers unlimited meals with \$150 per year in debit points for the snack bar. The *Base Plan* offers 12 meals per week with \$300 per year in debit points. The *8 Meal Plan* offers 8 meals per week with \$550 per year in debit points. The *150 Block Meal Plan* offers 150 meals for the semester with \$300 per year in debit points. Each meal plan also comes with 6 guest meals per semester.

Challenge Exam Fee: \$100

This fee is required when students take challenge exams for college credit or advanced standing.

Course Fee

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

Course Change Fee: \$20 per change

This charge is for students who alter their schedules after the second week of classes.

Deferred Payment Fee: \$50 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.) will be providing payment past the normal due date.

Facilities Fee: up to \$350 per semester

This fee is charged per semester to all matriculated students. Full-time equivalent students (12 credits or more) are charged \$350 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: \$82

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: \$2,133 per year or \$1,403 for spring semester

Health insurance is mandatory for all full-time students not otherwise covered. A student (or his/her parents) must present written proof certifying that he or she is 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 card by the published deadline will automatically be enrolled in and billed for the VSC Health Plan.

Late Financial Clearance Fee: \$100

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

Late Registration Fee: \$54

This fee is payable by all new, incoming students, including transfer students, to cover costs associated with registration, orientation, and testing.

Matriculation Fee: \$320

This fee applies to all matriculated students. For new students only, the incoming rate is \$320. There is a one-time charge for first semester enrolled.

Portfolio Assessment Fee: \$50

This fee is for each portfolio submitted for review.

Registration Fee: \$50

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

Returned Check Fee

There is a \$25 service charge on checks returned to the business office for insufficient funds and no future checks will be cashed.

Student Activity Fee: up to \$118 per semester

This fee covers the expense of student clubs, activities, and publications. It also covers admission to most campus events such as concerts, dramatic productions, films, and lectures, as well as recreational and social activities.

Transcript Evaluation Fee: \$50

This fee covers the cost of evaluating and processing transfer credit and advanced standing (waived for transcripts from VSC institutions).

Transcript Fee: \$5 per copy

This fee covers the cost of processing transcripts after the initial free copy.

Textbooks and 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 that have financial aid to cover college expenses plus books will be eligible to charge books to their student accounts 30 days prior to the start of each semester.

Automotive Technology and Construction Practice & 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 Technical Mathematics and Calculus, 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 will 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 his or her 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.

Who really pays the bill?

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 will be available online at <https://portal.vsc.edu> (select the "VSC Bill Payment" box to the left) beginning June 1st. You must have a log-in ID, a password, and a billing statement to access this service.

We offer four convenient in-house plans:

- Six payments from June through November
- Five payments from July through November
- Four payments from August through November
- Three plans from September 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 15th 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 1st.

Veterans who are certified as eligible for the GI Educational Assistance allowance will be 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 will be denied enrollment for the succeeding semester; issuance of grades or transcripts; or graduation. Reasonable interest and collection costs may be added to delinquent accounts.

Refunds

Tuition, Fees, Room, and Board

If students withdraw or are dismissed before the 60% point of the term, they will be credited tuition, the student activities fee, room, and board on a prorated basis. The date of withdrawal or dismissal is determined by the registrar's office. The prorated calculation will use 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 will first be applied to financial aid sources. Federal regulations will be 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 will be 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 will be credited for each full week of extended illness or authorized absence. There will be 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 from the college 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 will be offered financial aid, subject to the availability of these funds. The amount of any award is determined by the amount of the student's need as computed from information provided by the family on the Free Application for Federal Student Aid (FAFSA) www.fafsa.ed.gov. Recent 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 will be 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 will be required to submit additional information and will be sent a tracking letter accordingly. Please know the Financial Aid office 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 will be directed to use the IRS Data Retrieval Tool to report and/or update their income information on the FAFSA. The FAFSA Data Retrieval Tool is accessible through the FAFSA website: www.fafsa.gov

Expected Family Contribution

The needs analysis system evaluates all of the information requested and determines a reasonable contribution to be expected from the parent and student towards the student's 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 college aid. If family financial circumstances change significantly after filing the FAFSA (due to loss of employment, extended illness or disability, etc.), the family should write to the financial aid office as soon as possible, outlining this change in personal resources.

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 FAFSA is filed, 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 students who are eligible will receive Pell Grant 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 will be 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 for a PLUS Loan must fill out a PLUS Loan Request Form which is available through the financial aid office. A PLUS loan 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.

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**, the amount awarded depending on a student's need and the availability of funds at Vermont Tech. Average loans 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 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. On-line access is available at www.vsaac.org

Grants from other states include Maine, New Hampshire, Rhode Island, Connecticut, and Massachusetts. These states offer undergraduate grants or scholarships usable at Vermont Tech. Vermont Tech encourages all students eligible for these grants to 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

Vermont Tech programs are approved by the Vermont State Approving Agency, Office of Veterans' Affairs. These benefits are generally available to veterans who are separated from active duty within the past ten years; veterans with service-connected disabilities; and the sons, daughters, spouses, and widows or widowers of deceased or totally disabled veterans.

Veterans' Benefits GI Bill: Educational benefits are available to any honorably discharged veteran who enlisted for active duty and was on active duty for at least 181 consecutive days. Students must make application to the Veterans Administration. The Department of Veterans Affairs GI bill web site, www.gibill.va.gov is the comprehensive resource for those interested in learning about and applying for these benefits.

Additional information and assistance with applying for benefits is available from the Office of the Registrar and the Business Office.

First payment from the Veterans Administration normally takes 4-6 weeks from the beginning of the term.

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 and/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 will be reviewed on a semester basis. Students not making SAP (either the pace or the GPA requirement) as described below will lose their financial aid eligibility for all aid types. Students will 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 Registrar's Office. Dropped courses will not be included. Courses from which the student is withdrawn after the end of the add/drop period will be counted toward attempted courses. For financial aid eligibility, total hours attempted, including transfer credits counted toward the degree, can not 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 ($12 \times 67\%=8$).

- 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 documents by the Registrar's Office.
- 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* ($68 \times 150\%=102$). **Please note that different programs have different degree requirements. Consult the catalog description for your specific degree program requirements.*

Students who have reached the maximum time frame will not be 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 will be sent to each student not making SAP. The form will explain 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 will have to 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 will be 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 will be limited to two SAP appeals.

If a student's appeal is approved, the student will be 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 by the school to a student who fails to meet SAP and 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 will 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 VTC's 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 will normally be counted when the student changes degree programs. Each case will be 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 and 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 will 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, whether accepted toward the student's academic program or not, are counted when measuring time progression but do not impact the 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, he or she will be issued a revised award reflecting an adjustment to avoid an over-award situation. Any initial adjustment will be 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 he or she has notified us to the contrary. If a student changes his or her status from full- to part-time enrollment, an aid adjustment may result.

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

The goals of Vermont Tech's general education component, within both the prescribed and the elective areas of the curriculum, are designed to foster within each student an appreciation for the major domains of human achievement; to provide a common educational experience; to refine critical thinking, writing, information literacy, and communication skills; to nurture civic responsibility; to celebrate diversity and common values; to foster life-long learning; and to produce a well-rounded graduate.

The college does not guarantee that general education or elective courses will be 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.

Course requirements also may 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.

Associate degree requirements (20 credits minimum):

Depending on specific program requirements, each associate degree student will complete 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
- 3 credits of arts and humanities
- 3 credits of social science
- 3 credits of mathematics/critical thinking

Bachelor's degree requirements (36 credits minimum):

In addition to the basic associate degree requirements, and depending on specific program requirements, each bachelor's degree student will complete a minimum of the following additional general education requirements:

- 6 credits of arts/humanities or social sciences (3 credits minimum at the 3XXX level)
- 3 credits of information technology
- 4 credits of natural or physical sciences
- 3 credits of mathematics/critical thinking

All courses that are at a higher level or are a continuation of the listed initial courses will meet the general education requirements of the initial offerings. For example, if PHY 1041 is listed as meeting the science requirement, PHY 1042 also will satisfy the science requirement.

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

English Requirements

Each student will complete English Composition or an equivalent course or sequence of courses that will emphasize reading and writing and will require the successful completion

of a research paper. Degree students may satisfy the English Composition 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 English composition requirements. This might require summer courses or additional terms.

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

Information Technology Requirements

Each student will be introduced to computer information technology to include internet orientation, research, e-mail, word processing, and computer software applications applicable to their field of study. The following courses meet minimum IT requirements:

ACC 1010	Computerized Accounting	3	CIS 2025	C Programming	4
ARE 1021	Architectural CAD I	2	CPM 1021	Construction Graphics I	1
BUS 1051	Information Processing I	3	CPM 2050	Construction Management Software	1
BUS 2131	Office Administration I	3	LAH 1031	CAD for Landscape Design	1
CET 1031	Engineering/Survey Comp Apps I	3	MEC 1011	Design Communication I	2
CIS 1030	Introduction to Computers	3	MEC 1050	Computer Apps for Mechanical	1
CIS 1050	Introduction to Spreadsheets	1	NUR 1020	The Nurse/Client Relationship	3
CIS 1080	Intro Spreadsheet/Database Mgmt	2	RSP 1011	Respiratory Care I Lab	4
CIS 1151	Website Design	3			

Mathematics/Critical Thinking Requirements

Each student will complete 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 will satisfy the logic and critical thinking component of this requirement.

ARE 2040	Construction Practices	3	MAT 1210	Principles of Math	5
CIS 1420	Computational Foundations	4	MAT 1221	Finite Mathematics	3
CPM 2010	Construction Estimates	3	MAT 1340	Algebra & Trigonometry	5
MAT 1040	Math for Allied Health	2	MAT 1420	Technical Mathematics	5
MAT 1100	Math for Technology	3	MAT 2021	Statistics	5
MAT 1111	Intro to Technical Math I	5	MAT 2120	Discrete Structures	3
MAT 1112	Intro to Technical Math II	5	PHI 1030	Introduction to Logic	3

Natural Sciences Requirements

Students will be introduced to natural or physical sciences, including a lab experience. The course of study is determined by the major can be filled by coursework available as electives. These science courses include BIO, CHE, ENV, PHY, and SCI, as well as appropriate course work under other subject listings.

BIO 1020	Environmental Biology	3	BIO 2320	Zoology	4
BIO 1030	Nutrition	3	CHE 1020	Introduction to Chemistry	4
BIO 1220	Botany	4	CHE 1031	General Chemistry I	4
BIO 2011	Human Anatomy & Physiology I	4	PHY 1041	Physics I	4
BIO 2012	Human Anatomy & Physiology II	4	PHY 1042	Physics II	4
BIO 2040	Entomology	3	PHY 2041	Fundamentals of Physics I/Calculus	4
BIO 2120	Elements of Microbiology	4	PHY 2042	Fundamentals of Physics II/Calculus	4

Arts and Humanities Electives (AH)

Each degree student will be exposed to the methods of inquiry and major concepts in the arts and humanities. Courses at the lower (1XXX-2XXX) level will be offered in survey-type and special topics courses to expose students to a broad array of concepts and to enhance reading, writing, and communication skills. Courses at the upper (3XXX-4XXX) level will be more in-depth and will require a higher level of student learning and understanding.

ARH 1010	Intro to Art History	3	HUM 2040	The Holocaust	3
ARH 2660	European Classroom	3	HUM 2050	Women's Spirituality	3
BUS 2250	Business Ethics	3	HUM 2060	Cyberethics	3
BUS 3410	Business Ethics	3	HUM 2070	Vampires in Literature, Culture, & Film	3
ENG 1070	Effective Speaking	3	HUM 2080	Literature & Culture of Witchcraft	3
ENG 1310	Introduction to Literature	3	HUM 2110	Vietnam in Literature & Film	3
ENG 2070	Grant Writing	3	HUM 2330	Peace Studies	3
ENG 2101	Introduction to Creative Writing	3	HUM 2710	Special Topics in Humanities	3
ENG 2320	Themes in American Literature	3	HUM 3050	Theories of Science & Technology	3
ENG 2485	Literature of Peace & Pacifism	3	HUM 3070	Vampires in Literature, Culture, & Film	3
ENG 2550	Science Fiction Literature	3	HUM 3330	Peace Studies & Peacemaking	3
ENG 2590	Stephen King in Literature & Film	3	ITA 1011	Italian I	3
ENG 3485	Tradition of Anti-War Literature	3	PHI 1010	Introduction to Philosophy	3
ENG 3490	Crime & Punishment	3	PHI 1030	Introduction to Logic	3
ENG 3590	Films & Novels of Stephen King	3	PHI 1040	Introduction to Ethics	3
FRE 1111	French I	3	PHI 2010	Comparative Religion	3
HUM 1010	Music Appreciation	3	PHI 2060	Business Ethics	3
HUM 1028	History of Rock & Roll	3	SLS 1011	Sign Language	3
HUM 2010	Educational Inquiry	3	SPA 1011	Spanish I	3
HUM 2020	Bioethics	3	THA 2060	Women in Film	3
HUM 2030	Folklore	3	THA 2070	Comedy in Film	3

Social Sciences Electives (SS)

Each degree student will be exposed to an understanding of human behavior, personality, politics, and economics as well as the social context of human interaction. Courses at the lower (1XXX-2XXX) level will be offered in survey-type and special topics courses designed to enhance reading, writing, and communication skills within the context of the social sciences. Courses at the upper (3XXX-4XXX) level will be more in-depth and will require a

higher level of student learning and understanding.

The SS electives will include survey-type courses from the following areas: anthropology, economics, geography, history, political science, psychology, sociology, and social science including (but not limited to) the following:

ANT 1010	Cultural Anthropology	3	HIS 2130	African American History	3
BUS 2440	Intro to Business Law	3	HIS 2140	The Civil War	3
BUS 2450	Business Law	3	HIS 2150	History of the US in the Sixties	3
CRJ 1010	Introduction to Criminal Justice	3	HIS 2210	Women in US History	3
ECO 1010	Economics & Society	3	HIS 2220	The Wild, Wild West	3
ECO 2020	Macroeconomics	3	HIS 2230	Modern Russian History	3
ECO 2030	Microeconomics	3	HIS 2240	Survey of Eurasia	3
ENV 1110	Intro to Environmental Problems	3	HIS 2250	Modern Middle Eastern History	3
ENV 2070	Environmental Law	3	HIS 2330	Traditional Asia	3
ENV 3050	Issues in Environmental Studies	3	HIS 2340	Modern Chinese History	3
GEO 1010	World Geography	3	HIS 2350	Modern Pacific Asian History	3
GEO 1020	Physical Geography	3	HIS 2410	Latin American History & Culture	3
GEO 1030	Intro to Planning & Zoning	3	HIS 2420	Modern Latin American History	3
GEO 1040	Maps & Map Reading	3	HIS 2430	Survey of Africa	3
GEO 1050	Geography/Economic Development	3	HIS 2440	African Civilization	3
GEO 1060	Geography Modern Overview	3	HIS 2450	Modern African History	3
GEO 2010	The Connecticut River Valley	3	HIS 2510	Historian at Work	3
GEO 2030	Rural Land Planning	3	HIS 2520	Introduction to Genealogy	3
GEO 2060	Environmental Problems in Geography	3	HIS 2530	Women in History	3
GEO 2070	North America	3	HIS 2660	European Classroom	3
GEO 2090	Africa	3	HIS 2710	Special Topics in History	3
GEO 2150	Cultural Geography	3	HIS 2720	Special Topics in Vermont History	3
GEO 2160	Travel & Tourism	3	HIS 2730	ST Political Correct/Truth/20 th Century	3
GEO 2910	Independent Study	3	HIS 3165	Vermont History & Government	3
HIS 1011	Western Civilization I	3	POS 1010	Introduction to Political Science	3
HIS 1012	Western Civilization II	3	POS 1020	Intro to American Politics & Govt	3
HIS 1020	Comparative Civilizations	3	POS 1030	Comparative Government	3
HIS 1211	American History I	3	POS 1040	African American History & Politics	3
HIS 1212	American History II	3	POS 1050	The Constitution	3
HIS 1220	Native American Histories/Cultures	3	POS 1060	Law & the Individual	3
HIS 1230	History of America to 1763	3	POS 2010	Observing the Legal Process	3
HIS 1240	Colonial America & the Revolution	3	POS 2020	Family Law	3
HIS 1260	Info Tech: Past, Present, & Future	3	POS 2030	UN & World Politics	3
HIS 2070	Vermont History	3	POS 2040	International Relations	3
HIS 2110	US History: 1945-Present	3	POS 2050	International Economics & Politics	3
HIS 2120	Social Reform in America	3	POS 2110	State & Local Government	3

POS 2120	Consumer Law	3	PSY 1121	Intro to Behavioral Analysis	3
POS 2701	Environmental Politics	3	PSY 2310	Adolescent Development	3
POS 2310	Environmental Politics	3	SSC 2020	Experience Russia	3
PSY 1010	Introduction to Psychology	3	SSC 2040	Experience Brazil	3
PSY 1020	Child Abuse & Neglect	3	SSC 2050	Experience China	3
PSY 1030	Psychology of Consciousness	3	SSC 2010	Science, Technology, & Society	3
PSY 1040	Human Interaction	3	SSC 2030	Energy & Society	3
PSY 1050	Human Growth & Development	3	SSC 3010	Revolution: Call to Serve	3
PSY 1110	Observe, Record, Report	3	SSC 3045	News & Newspapers	3

Students taking courses in English, humanities, and social sciences:

- Gain experience with the unique content and methods of inquiry in social sciences and in arts/humanities
- Demonstrate competence with written communication by achieving the required standard on the written communication assessment
- Focus written work around an explicit or implicit central thesis
- Develop the central thesis as appropriate to the audience, using specific details and supporting evidence
- Organize written work clearly and logically
- Use correct grammar, syntax, punctuation, and spelling
- Follow standard practices in quotation, summary, paraphrase, and citation of textual material

Graduation Standards

In addition to the required course work, all Vermont Tech graduates will satisfy four additional graduation standards in written communication, oral communication, information literacy, and quantitative reasoning. These standards will be 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.

Academic Programs

The following pages contain course descriptions and curricula for all of Vermont Tech's current majors. In addition to the information provided for each program, the following notes should be considered, as applicable:

All students who place into ENG 1042 must also take ENG 1060 to complete first-year English.

Associate degree students *must* complete a minimum of one Arts and Humanities (AH) and one Social Science (SS) elective

Bachelor's degree students *must* complete a minimum of four Arts and Humanities (AH) and Social Science (SS) electives, with at least one at the 3XXX level.

All Architectural Engineering students may choose from various department-approved courses related to math, engineering, science, or business. Elective availability depends on scheduling.

Students in the following programs who do not place into MAT 1420 will be required to complete the Engineering Foundations Track (EFT) prior to entering an engineering first year curriculum: Architectural & Building Engineering Technology, Architectural Engineering Technology, Civil & Environmental Engineering Technology, bachelor's in Computer Engineering Technology, Electrical Engineering Technology, Mechanical Engineering Technology, and Undeclared Major.

For the following programs, technical electives *must* be approved by the department: Agribusiness Management Technology, associate in Business Technology & Management, bachelor's in Electrical Engineering Technology, and Landscape Design & Sustainable Horticulture.

Computer Engineering Technology, Computer Information Technology, and Computer Software Engineering students must complete CIS 2271 or CIS 2261 and 2262.

Students in the bachelor's program for Computer Engineering must take a minimum of 12 credits from: CIS 3010, 4030, 4040, 4050, 3XXX, 2 4XXX, and 4140.

CIS 3XXX electives include 3000- and 4000-level CIS courses and program-approved electives, including BUS 3250 and 4310, MAT 2532 and 3720.

Agribusiness Management Technology

Graduates of this program generally pursue careers with the industries and agencies that serve production agriculture. Some typical career choices include: sales and service representatives for feed, fertilizer and equipment industries; inspectors of milk and other agricultural products; rural credit officers; or specialists with agencies such as the Dairy Herd Improvement Association, the Soil Conservation Service, and the Peace Corps.

Students benefit from the combination of classroom instruction and practical laboratory experience, which includes use of the extensive facilities at the college farm. In addition to the important basics in plant and animal agriculture, the program emphasizes business and communication skills.

Students who complete a degree in Agribusiness Management Technology can transfer seamlessly into the bachelor's program in Business, Diversified Agriculture, or Sustainable Design & Technology.

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

- Understand the income and expense sources of varied agricultural business
- 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

The normal number of credits required for a degree is 66.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
ACC 2121	Financial Accounting	4	ACC 1010 Computerized Accounting	3
AGR 1011	Agricultural Techniques I	2	ACC 2122 Managerial Accounting	4
AGR 1050	Livestock Production	3	ENG 2080 Technical Communication	3
ENG 10XX	English	3	LAH 1050 Introduction to Soils	4
LAH 1020	Introduction to Horticulture	3	AGRXXXX Ag elective	<u>2-4</u>
MAT 1210	Principles of Mathematics	<u>3</u>		
		<i>18</i>		<i>16-18</i>

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
BUS 2210	Small Business Management	3	BUS 2230 Principles of Marketing	3
CHE 1020	Introduction to Chemistry	4	BUS 2410 Human Resource Management	3
CIS 1080	Intro Spreadsheet/Db Mgmt	2	ENG 1070 Effective Speaking	3
ELEXXXX	AH/SS elective	3	ELEXXXX AH/SS elective	3
Select two:	(6 credits minimum)		ELEXXXX Elective	<u>3-4</u>
AGR 2020	Farm Buildings	3		
AGR 2040	Forage Production	3		
AGRXXXX	Ag elective	3		
BUS 2020	Principles of Management	3		
BUS 2260	Principles of Financial Mgmt	3		
BUS 2270	Organizational Communication	4		
BUSXXXX	Business elective	<u>3-4</u>		
		<i>18-19</i>		<i>15-16</i>

Architectural & Building Engineering Technology

Graduates of this program are prepared for a wide range of careers in the constructed facilities industry, including those in sustainable, energy-efficient, and environmentally-conscious fields, at the technical and design support level. Graduates understand the importance of teamwork and of the economic, social, and environmental consequences of choices made in the exciting building industry. They typically enjoy positions with architects, engineers, and building contractors and provide all levels of support to the building industry in manufacturing, sale, and governmental administration. Graduates of the program are also prepared to advance to bachelor's degree programs in architecture or engineering to further enhance their abilities to effect positive change in the world.

Graduation from the program at the associate level allows students an ideal opportunity to make an informed decision relative to their career paths. This "decision platform" offered to students completing their associate degree is one of the program's greatest strengths. Students may continue on into a bachelor of science degree program in Architectural Engineering Technology; Sustainable Design & Technology; Construction Management; or Business Technology & Management. Some program graduates transfer to other schools of architecture or engineering to continue working toward a bachelor's or other degree in these fields.

Educational objectives for students with an Associate of Applied Science in Architectural and Building Engineering Technology include:

- **Graphic communication skills:** Graduates are able to use freehand sketches, board drafting, presentation graphics, and CAD as tools for design and communication.
- **Communication skills:** Graduates are able to communicate 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:** Graduates understand residential and commercial building systems, materials, and regulations; apply that knowledge to site layout and material estimating; and use appropriate computer applications.
- **Architectural design:** Graduates demonstrate knowledge of historical precedents and aesthetics and use design principles (including energy use, conservation, and sustainability concepts) as part of a process to create workable building designs.
- **Engineering design:** Graduates understand design principles and apply 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.

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The normal number of credits required for a degree is 71.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
ARE 1000	Freshman Seminar	1	ARE 1210 Construction Materials & Methods	6
ARE 1010	Arch Woodframe Construction	3	ARE 1220 Architectural History	3
ARE 1021	Architectural CAD I	2	MAT 1520 Calculus for Engineering	4
CIS 1050	Introduction to Spreadsheets	1	Select one:	
ENG 10XX	English	3	PHY 1041 Physics I	4
MAT 1420	Technical Mathematics	5	PHY 2041 Physics I w/Calculus	4
ELEXXXX	AH/SS elective	<u>3</u>		
		18		17

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
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 Architecture Seminar	1
CET 2040	Statics & Strength of Materials	4	CET 2120 Structural Design	4
ENG 2080	Technical Communication	3	ELEXXXX AH/SS elective	3
PHY 1043	Physics II for Architectural	<u>3</u>	ELEXXXX Technical elective	<u>3-4</u>
		19		17-18

Bachelor of Science in Architectural Engineering Technology

Graduates of this bachelor's program receive broad-based preparation to succeed in numerous challenging 21st century career opportunities in the building design and construction industries. Education in this area provides the opportunity to merge "green", environmentally sustainable, and socially conscious career aspirations with competitive salaries and the satisfaction of seeing creative, energy-efficient designs become reality. Within the scope of the discipline fall such diverse areas as structural engineering; HVAC design; electrical and lighting design; plumbing and fire protection; construction management; and facilities management.

Students may enroll as freshman candidates for the bachelor's degree or may choose to enroll first as associate degree candidates and defer a decision on bachelor's candidacy until the second year. Transfer students from other two- and four-year architecture and engineering programs are encouraged to apply.

The bachelor's program builds on the foundation established in the associate program in structures, HVAC, plumbing, electrical, and integrated sustainable design. The scope of the curriculum is also extended to include such fields as thermodynamics, fluid mechanics, electrical circuits, lighting systems, AE management, and advanced math. Advanced computer applications are included. Throughout the curriculum, teamwork, creativity, and "green" solutions to building needs complement rigorous traditional engineering-based instruction.

Graduates are allowed to sit for the Fundamentals of Engineering examination in many states and, after meeting state requirements for appropriate work experience, may also be examined for the Professional Engineer designation in many states.

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

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

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The normal number of credits required for the degree is 131.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ARE 1000	Freshman Seminar	1	ARE 1210	Construct. Materials & Methods	6
ARE 1010	Arch Woodframe Construction	3	ARE 1220	Architectural History	3
ARE 1021	Architectural CAD I	2	MAT 1520	Calculus for Engineering	4
CIS 1050	Introduction to Spreadsheets	1	Select one:		
ENG 10XX	English	3	PHY 1041	Physics I	4
MAT 1420	Technical Mathematics	5	PHY 2041	Physics I w/Calculus	4
ELE.XXXX	AH/SS elective	<u>3</u>			
		18			17

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
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	Architecture Seminar	1
CET 2040	Statics & Strengths of Materials	4	CET 2120	Structural Design	4
ENG 2080	Technical Communication	3	MAT 2532	Calculus II	4
PHY 1043	Physics II for Architectural	<u>3</u>	ELEXXXX	AH/SS elective	<u>3</u>
		19			18

Third Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ARE 2022	Architectural CAD II	3	ARE 3010	Design Systems Integration	3
ARE 3020	Structural Analysis	3	ARE 3030	Steel Structures Design	3
ARE 3111	Codes & Loads: Structural	1	ARE 3040	Electrical/Lighting Systems	3
ARE 3112	Codes & Loads: Electromech	1	ARE 3050	Fluids/Thermodynamics	4
ELT 3020	Electrical Circuits & Controls	4	CHE 1031	General Chemistry I	4
ENG 1070	Effective Speaking	<u>3</u>			
		15			17

Fourth Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ARE 4010	Concrete Structures Design	3	ARE 4040	Plumbing Systems	3
ARE 4020	Architectural Engineering Mgmnt	3	ARE 4050	FE Exam Survey	1
ARE 4030	HVAC Systems	4	ARE 4720	Senior Project	4
ELE 3XXX	AH/SS elective	<u>3</u>	ELEXXXX	AH/SS elective	3
			ELEXXXX	Technical elective	<u>3-4</u>
		13			14-15

Automotive Technology

Graduates of this program will have the knowledge and skills necessary to maintain, diagnose, and repair mechanical and electronic systems in any automobile or light/medium-duty truck. The comprehensive nature of the program ensures that graduates are prepared to solve problems on vehicles regardless of origin. The combination of technical knowledge, program philosophy, and emphasis on lifelong learning prepares the graduate with a solid foundation for success in all aspects of the automotive technology profession.

Throughout the curriculum, faculty and staff reinforce the principles of professional ethics, critical thinking, and problem solving as they are applied to the workplace. Students are also introduced to basic business management practices.

Students are required to wear black jeans and steel-toed leather work or hiking boots in all laboratory sections. The college will provide t-shirts.

Student learning outcomes for the Associate of Applied Science in Automotive Technology include:

- Understanding 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
- Communicating effectively with customers and business relations
- Exhibiting the principles of professional conduct in all aspects of customer relations

Students must have in their possession a set of tools for use in the laboratory and during the summer cooperative work experience.

This program has been developed with the support and encouragement of the Vermont Automobile Dealer's Association.

The normal number of credits required for a degree is 65.

First Year

Fall Semester

ATT 1010	Suspension & Steering	3
ATT 1020	Engine Diagnostics & Repair	4
ATT 1120	General Electronics	4
ENG 10XX	English	3
MAT 1100	Mathematics for Technology	3
		17

Spring Semester

ATT 1040	Automotive Electrical Systems	4
ATT 1050	Brakes & Wheel Alignment	4
CIS 1050	Introduction to Spreadsheets	1
PHY 1030	General Physics	4
ELEXXXX	AH/SS elective	3
		16

Summer Semester

ATT 2801	Summer Internship	0
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Second Year

Fall Semester

ATT 2010	Engine Performance	4
ATT 2020	Body Electronic Systems	4
ATT 2802	Internship Review	1
BUS 2210	Small Business Management	3
ELEXXXX	AH/SS elective	3
		15

Spring Semester

ATT 2030	Advanced Engine Performance	4
ATT 2040	Automotive Drive Trains	4
ATT 2060	Advanced Technology Vehicle	4
ENG 2080	Technical Communication	3
MEC 1020	Manufacturing Process	2
		17

Students must complete a minimum of one Arts and Humanities (AH) and one Social Science (SS) elective. (PSY 1010 is strongly recommended.)

Business Technology & Management

Graduates of this program enjoy a wide range of career options in business, industry, government, and public institutions. They may be office managers; staff accountants; accounting specialists; marketing and communication coordinators; sales and customer service managers; project managers; or small business owners. As an alternative to immediate employment, graduates may choose to enroll in the bachelor's degree program at Vermont Tech or they may transfer to a bachelor's degree program elsewhere with majors such as marketing or accounting.

Highlights of the program include a formal business dinner where students dress in professional attire and learn the rules of formal dining. Students also learn resume writing and job interview skills and attend a "mocktail" reception and interview. Seniors complete a capstone project which includes a team oral presentation judged by professionals from business and industry.

Students with an Associate of Applied Science in Business Technology and 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; and understand module integrated accounting software and use Peachtree software to record and process typical transactions and prepare financial statements
- Use Microsoft's Word, Excel, PowerPoint, and Access to create business documents; use Microsoft Publisher to design and develop newsletters, brochures, and other promotional materials. Students will be introduced to additional document and communication collaboration systems
- Write business letters, memos, e-mail messages, instant messages, and blog posts; create reports using accurate research methods and citations; and 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 their career goals
- Understand the key characteristics and terminology of the business disciplines of management, human resources, marketing, and finance

The normal number of credits required for a degree is 64.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ACC 2121	Financial Accounting	4	ACC 1010	Computerized Accounting	3
BUS 1010	Introduction to Business	3	BUS 1052	Information Processing II	3
BUS 1051	Information Processing I	3	CIS 1080	Intro Spreadsh/Database Mgmt	2
ENG 10XX	English	3	ENG 1070	Effective Speaking	3
MAT 1210	Principles of Mathematics	3	ELEXXXX	AH/SS elective	3
Select one:					
			ACC 2122	Managerial Accounting	4
			ELEXXXX	Elective	3-4
				16	17-18

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
BUS 2020	Principles of Management	3	BUS 2132	Management Applications	3
BUS 2131	Business Communication Tech	3	BUS 2230	Principles of Marketing	3
BUS 2270	Organizational Communication	4	BUS 2410	Human Resource Management	3
ELEXXXX	AH/SS elective	3	BUS 2720	Business Seminar	3
Select one:			ENG 2080	Technical Communication	3
BUS 2210	Small Business Management	3			
BUS 2260	Principles of Financial Mgmt	3			
BUS 2440	Introduction to Business Law	3			
CIS 1151	Website Design	3			
ELEXXXX	Elective	3-4			
SCI XXXX	Science elective	4			
				16-17	15

Bachelor of Science in Business Technology & Management

Graduates of this bachelor's program will possess high tech applied skills combined with management and leadership skills directly related to the use of technology in business and industry. The course content and sequence link with functional management areas through case studies and real-world situations. The focus throughout is how technical skills, interpersonal skills, and technology help to build a competitive strength in business.

Students with a Bachelor of Science in Business Technology and 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, e-mail 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. Students will be introduced to additional document and communication collaboration systems
- 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 can integrate these disciplines to develop and affect corporate strategies and plans

The minimum number of credits for a degree is 120.

Core Courses		Credits
ACC 1010	Computerized Accounting †	3
ACC 2121	Financial Accounting	4
BUS 2020	Principles of Management	3
BUS 2131	Business Communication Technology †	3
BUS 2132	Management Applications †	3
BUS 2230	Principles of Marketing	3
BUS 2260	Principles of Financial Management	3
BUS 2270	Organizational Communication †	4
BUS 2410	Human Resources Management	3
BUS 2440	Introduction to Business Law	3
BUS 2720	Business Seminar †	3
BUS 3150	Production & Operations Management	3
BUS 3250	Organizational Behavior & Management	3
BUS 3410	Business Ethics	3
BUS 4310	Business Information Architecture	3
BUS 4530	Technical Project Management	3
BUS 4730	Senior Project	3
CIS 1080	Introduction to Spreadsheets & Database Management †	2
ENG 106X	English	3
ENG 2080	Technical Communication	3
MAT 1221	Finite Mathematics	3
MAT 2021	Statistics	3
SCI XXXX	Laboratory science elective	4
ELE XXXX	AH elective	3
ELE XXXX	SS elective	3
ELE XXXX	AH/SS elective	3
ELE 3XXX	Upper level AH/SS elective	3
Select one:		
ECO 2020	Macroeconomics	3
ECO 2030	Microeconomics	3

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Note: All core courses or equivalent coursework must be completed. The above courses marked with a † will be waived for students who have an associate degree or a minimum of 50 credits prior to entering the program.

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.

After completion of the baccalaureate degree, the graduate who meets the minimum standards as outlined in the Vermont Tech/Clarkson University articulation agreement for a one year Masters Degree in Business Administration (MBA) may be admitted into the Clarkson program.

Civil & Environmental Engineering Technology

No discipline offers a greater diversity of career opportunities than does civil and environmental engineering. Civil and environmental engineering technicians work on every phase of design and construction of buildings, roadways, bridges, public water systems, dams, landfills, and recreation facilities.

Graduates of this program have the opportunity to work outdoors on construction and surveying projects or indoors in design or estimating offices. Students are well prepared to continue in Vermont Tech's Bachelor of Science programs in Architectural Engineering Technology, Sustainable Design & Technology, Construction Management, or Business Technology & Management or pursue a bachelor of science degree in civil or environmental engineering.

The Civil and Environmental Engineering Technology program provides training in design, surveying, materials testing, the construction process, structural design of buildings, water/wastewater engineering, and solid waste management. Students learn to prepare engineering drawings using computer-aided drafting and design (CAD) at state-of-the-art computer workstations. Graduates find work with engineering design firms, government agencies, construction firms, and testing laboratories. Some graduates go on to become licensed land surveyors or registered professional engineers.

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

- Perform in the workforce with confidence in the use of CAD software and the ability to create site plans from raw survey data, design sewage disposal systems, and develop profiles and cross-sections for highway design
- Communicate technical information in writing, speaking, listening, and interpersonal skills to work effectively as part of a team in the workforce
- Understand the principles of plane surveying, water/wastewater treatment, engineering materials, and estimating quantities and, using appropriate computer applications, apply that knowledge as a consultant in the workforce
- Be able to understand design principles and function 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
- Develop the skills and ability needed to continue learning through formal education or adapt to changing technologies in the workplace

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The normal number of credits required for a degree is 71.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
CET 1000	Freshman Seminar	1	CET 1020	Engineering Materials	4
CET 1011	Surveying I	3	CET 1032	Computer Applications II	3
CET 1031	Computer Applications I	3	ENG 2080	Technical Communication	3
CHE 1031	General Chemistry I	4	MAT 1520	Calculus for Engineering	4
ENG 10XX	English	3	Select one:		
MAT 1420	Technical Mathematics	5	PHY 1041	Physics I	4
			PHY 2041	Physics I w/Calculus	4
		19			18

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
CET 2012	Surveying II	4	CET 2050	Civil & Environmental Design	4
CET 2020	Hydraulics & Drainage	3	CET 2060	Constr Estimates & Records	3
CET 2030	Env Engineering & Science	3	CET 2110	Mechanics of Soils	3
CET 2040	Statics & Strengths of Materials	4	CET 2120	Structural Design	4
ELE.XXXX	AH/SS elective	3	ELE.XXXX	AH/SS elective	3
		17			17

Note: Students taking MAT 1520 (or equivalent) may take PHY 2041 instead of PHY 1041.

Computer Engineering Technology

Graduates of this program possess an understanding and working knowledge of both computer hardware and software. With a command of the total environment, a computer engineering technician is able to relate to both programmers and hardware engineers. The theory developed in the classroom is reinforced with laboratory work, which allows students to develop confidence and skill in their newly acquired knowledge and to accurately report the results of their observations. Along with two networked computer labs, students also use the facilities available in three additional instrumented electronics labs.

Computer Engineering Technology students share many common first-semester courses with the Electrical Engineering Technology students. This first semester provides students with a firm base in fundamental principles. Subsequent semesters' offerings stress a systems approach, with students investigating computer-based applications from both a hardware and a software perspective. Interfacing computers with their peripherals and network applications are emphasized. Graduates are well prepared for admission to Vermont Tech's Bachelor of Science program in Computer Engineering Technology.

With an extra year's work, students may pursue a dual associate degree with Electrical Engineering Technology.

Students with an Associate of Science in Computer Engineering Technology will be able to:

- Design and implement combinational and sequential digital circuits using simple tools and techniques
- Interface simple analog or digital hardware to a microcontroller and manipulate that hardware using programs in both assembly language and a high level language
- Understand port access, interrupt service routines, and hardware timing issues
- Develop small programs written in assembly language
- Develop small programs written in a high level language
- Understand the basic concepts of object-oriented programming
- Install and configure a significant operating system
- Administer a computer system by managing its resource usage, interpreting the output of monitoring tools, and troubleshooting system problems
- Apply knowledge of network protocols from the physical layer through the transport layer to analyze and troubleshoot TCP/IP network problems
- Clearly communicate technical information in both oral and written form to peers and supervisors
- Understand the computer engineering technology profession, its diversity, and its related ethical and social issues
- Function effectively in teams
- Demonstrate a commitment to quality, timeliness, continuous improvement, and lifelong learning

The minimum number of credits required for a degree is 68.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ELT 1031	Electrical Circuits I	4	ELT 1080	Electronics for CPE	4
ELT 1051	Presentation Graphics I	1	ELT 1110	Intro to Digital Circuits	4
ENG 10XX	English	3	MAT 1520	Calculus for Engineering	4
INT 1000	Freshman Seminar	1	PHY 1041	Physics I	4
MAT 1420	Technical Mathematics	5	If required:		
Select one:			CIS 2262	Intro Java Programming II	<u>2</u>
CIS 2261	Intro Java Programming I	4			
CIS 2271	Java Programming	4			
		18			16-18

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
CIS 2022	Intermediate C Programming	2	CIS 2151	Computer Networks I	4
CIS 2230	System Administration	4	CIS 2720	Current Topics in CPE	3
ELT 2050	Microprocessor Techniques	4	ELT 2040	Computer Sys Comp/Interfaces	4
ELEXXXX	AH/SS elective	3	ENG 2080	Technical Communication	3
Select one:			ELEXXXX	AH/SS elective	<u>3</u>
PHY 1042	Physics II	<u>4</u>			
PHY 2042	Physics II with Calculus	4			
		17			17

Bachelor of Science in Computer Engineering Technology

Graduates of this program will experience a balanced treatment of hardware, software, and administrative (or “systems”) topics. As with the two-year degree, upon which this bachelor’s program builds, this program explores what goes on “under the hood” of a computer system. Digital electronics and computer architecture are explored, as well as topics in programming, networks, and system administration. This broad-based approach is intended to give graduates a diverse range of career options.

Vermont Tech’s approach is to give students a good foundation in all aspects of computer technology so that they can adapt to changes in the field. Also, because hardware, software, and systems topics often overlap in the real world, Vermont Tech’s preparation will equip graduates to properly evaluate the entire computer system they are working with and understand how all of its aspects interact.

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

- Design and implement digital and embedded microcontroller systems in both the hardware and software areas using industry standard tools and techniques
- Evaluate new computer hardware technologies and make recommendations about such technologies based on features, performance, and cost
- Design and implement simple digital signal processing systems
- Implement standard algorithms and data structures, and develop network, multi-threaded, and graphical applications
- Understand the purpose of various programming language features and how those features are implemented
- Use standard software engineering tools
- Understand and evaluate system performance and security
- Understand basic database design and administration
- Build, test, and document operating system software, such as a device driver, that interacts directly with hardware
- Clearly communicate technical information in both oral and written form to peers and supervisors
- Understand the Computer Engineering Technology profession, its diversity, and its related ethical and social issues
- Function effectively in teams
- Demonstrate a commitment to quality, timeliness, and continuous improvement and lifelong learning

The minimum number of credits required for the degree is 137.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ELT 1031	Electrical Circuits I	4	ELT 1080	Electronics for CPE	4
ELT 1051	Presentation Graphics I	1	ELT 1110	Intro to Digital Circuits	4
ENG 10XX	English	3	MAT 1520	Calculus for Engineering	4
INT 1000	Freshman Orientation	1	PHY 1041	Physics I	4
MAT 1420	Technical Mathematics	5	If required:		
Select one:			CIS 2262	Intro Java Programming II	<u>2</u>
CIS 2261	Intro Java Programming I	4			
CIS 2271	Java Programming	<u>4</u>			
		<i>18</i>			<i>18</i>

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
CIS 2022	Intermediate C Programming	2	CIS 2151	Computer Networks I	4
CIS 2230	System Administration	4	CIS 2720	Current Topics in CPE	3
ELT 2050	Microprocessor Techniques	4	ELT 2040	Computer Sys Comp/Interfaces	4
PHY 1042	Physics II	4	ENG 2080	Technical Communication	3
ELEXXXX	AH/SS elective	<u>3</u>	ELEXXXX	AH/SS elective	<u>3</u>
		<i>17</i>			<i>17</i>

Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
CIS 4150	Software Engineering	3	BUS 2440	Introduction to Business Law	3
CIS 3050	Algorithms & Data Structures	3	CIS 3010	Database Systems	4
ELT 3010	Digital Circuits II	4	CIS 3152	Network Programming	4
MAT 2532	Calculus II	4	ELT 3050	Microprocessor Techniques II	4
ELE3XXX	Upper level AH/SS elective	<u>3</u>	MAT 3170	Applied Math for Engineering	<u>3</u>
		<i>17</i>			<i>18</i>

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
CIS 4020	Operating Systems	4	CIS 3XXX	CIS elective	3
CIS 3/4XXX	Upper level CIS elective	3	CIS 3XXX	CIS elective	3
CIS 4711	Project I	2	CIS 4712	Project II	3
ELT 4010	Computer Architecture	3	ELT 4020	Digital Signal Processing	4
MAT 3720	Topics in Discrete Mathematics	3	ELEXXXX	AH/SS elective	<u>3</u>
Select one:					
CIS 4030	GUI Programming	3			
CIS 4140	Human Computer Interface	3			
CIS 4210	Computer Graphics	<u>3</u>			
		<i>18</i>			<i>16</i>

Computer Information Technology

Graduates of this program are prepared to understand the organization and technology of computers, databases, networking, and other information technologies. Students are introduced to the breadth of technologies and to the basics of the business world.

Because of the broad technological background this program provides, students are well prepared to enter new technical areas as the field expands and evolves.

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

- Demonstrate fluency in multiple languages, including one object-oriented language and one scripting language
- Understand the fundamentals of computer hardware
- Be able to develop and manage complete web sites
- 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
- Demonstrate a solid background in business processes
- Understand the historical and social context of information technology

The student, in conjunction with the department chair, may develop a sequence of courses to best meet his or her background and needs that still satisfies the degree requirements. The typical curriculum taken by students is given below.

The minimum number of credits required for the degree is 66.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
CIS 1120	Intro to Information Technology	3	ACC 1020	Survey of Accounting	3
CIS 1151	Website Design	3	CIS 1152	Advanced Website Design	3
ENG 10XX	English	3	CIS 2150	Networks I	4
INT 1000	Freshman Seminar	1	ELEXXXX	AH/SS elective	3
Select one:			Select one:		
CIS 2261	Intro to Java Programming I	4	MAT 2120	Discrete Structures	3
CIS 2271	Java Programming	4	MAT 1520	Calculus for Engineering	4
Select one:			If required:		
MAT 1221	Finite Math	3	CIS 2262	Intro to Java Programming II	2
MAT 1420	Technical Mathematics	<u>5</u>			
<i>17-19</i>			<i>16-19</i>		

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
BUS 2020	Principles of Management	3	BUS 2230	Principles of Marketing	3
CIS 2230	System Administration	4	CIS 2235	Adv System Administration	4
CIS 2320	Software QA/Testing	3	ELEXXXX	AH/SS elective	3
ENG 1070	Effective Speaking	3	ENG 2080	Technical Communication	3
Select one:			SCIXXXX	Science elective	4
CIS 2260	Object-Oriented Programming	3			
CIS 2450	Advanced Web Technologies	3			
CIS 3210	Routing Concepts & WAN	4			
ELEXXXX	Elective	<u>3</u>			
<i>16-17</i>			<i>17</i>		

Bachelor of Science in Computer Information Technology

Graduates of this program are prepared to understand the organization and technology of computers, databases, networking, and other information technologies. Students are introduced to the breadth of technologies and to the basics of the business world.

Because of the broad technological background this program provides, students are well prepared to enter new technical areas as the field expands and evolves.

Students with a Bachelor of Science in Computer Information Technology should be able to meet all of the outcomes of the associate degree program, as well as:

- 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 professional, historical and social context of information technology and be able to make reasoned judgments about the social and ethical implications of their actions

In addition, all students must actively participate in the design, development, and evaluation of a sizable 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 his or her background and needs that still satisfies the degree requirements. The typical curriculum taken by students is given below.

The minimum number of credits required for the degree is 127.

First Year

<i>Fall Semester</i>				<i>Spring Semester</i>	
CIS 1120	Intro to Information Technology	3	ACC 1020	Survey of Accounting	3
CIS 1151	Website Design	3	CIS 1152	Advanced Website Design	3
ENG 10XX	English	3	CIS 2150	Networks I	4
INT 1000	Freshman Seminar	1	ELE XXXX	AH/SS elective	3
Select one:		Select one:			
CIS 2261	Intro to Java Programming I	4	MAT 2120	Discrete Structures	3
CIS 2271	Java Programming	4	MAT 1520	Calculus for Engineering	4
Select one:		If required:			
MAT 1221	Finite Math	3	CIS 2262	Intro to Java Programming II	<u>2</u>
MAT 1420	Technical Mathematics	<u>5</u>			

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
BUS 2020	Principles of Management	3	BUS 2230 Principles of Marketing	3
CIS 2230	System Administration	4	CIS 2235 Adv System Administration	4
CIS 2320	Software QA/Testing	3	ENG 2080 Technical Communication	3
ENG 1070	Effective Speaking	3	SCIXXXX Science elective	4
Select one:		Select one:		
CIS 2260	Object-Oriented Programming	3	CIS 2010 Computer Organization	4
CIS 2450	Advanced Web Technologies	3	CIS 2411 E-Commerce	3
CIS 3210	Routing Concepts & WAN	4	CIS 3250 Adv Network Architectures	4
		16-17		17

Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
BUS 2440	Business Law	3	CIS 3010 Database Systems	4
HUM 2060	Cyberethics	3	MAT 2021 Statistics	3
ELE 3XXX	Upper level AH/SS elective	3	ELE XXXX AH/SS elective	3
Select one:		Select one:		
CIS 3311	Systems Development Eng I	3	CIS 3312 Systems Development Eng II	3
CIS 4150	Software Engineering	3	CIS 4120 System Analysis	3
Select one:		Select one:		
CIS XXXX	CIS elective	3	BUS 3250 Organizational Behavior/Mgmnt	3
ELE XXXX	AH/SS elective	3	CIS XXXX CIS elective	3
		15		16

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
CIS 3170	History/Theory of Computing	3	BUS 4530 Technical Project Mgmnt	3
CIS 4721	Senior Project I	2	CIS 3XXX Upper level CIS elective	3
SCIXXXX	Science elective	4	CIS 4040 Computer Security	4
Select one:		Select one:		
BUS 4310	Business Information Architecture	3	CIS 4722 Senior Projects II	3
CIS 4140	Human Computer Interface	3	ELE XXXX AH/SS elective (if required)	3
CIS 4310	Computer Forensics	3		
CIS 3XXX	Upper level CIS elective	3		
Select one:		Select one:		
CIS 4030	GUI Programming	3		
CIS 4140	Human Computer Interface	3		
		15		15

Computer Software Engineering

Graduates of this program are prepared to make meaningful contributions to a software development group. Typical jobs for graduates might include test engineer, release engineer, or customer support engineer. Students may continue on to a Bachelor of Science Degree in Software Engineering, which adds an understanding of software development and significantly more technical depth.

Students 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 understanding assembly language
- Develop complete web sites
- 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

In addition, all graduates 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 his or her background and needs that still satisfies the degree requirements. The typical curriculum taken by students is given below.

The minimum number of credits required for the degree is 63.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
CIS 1120	Intro to Information Technology	3	CIS 1152	Advanced Website Design	3
CIS 1151	Website Design	3	CIS 2151	Computer Networks I	4
ENG 10XX	English	3	ELEXXXX	AH/SS elective	3
INT 1000	Freshman Seminar	1	Select one:		
Select one:			MAT 2120	Discrete Structures	3
CIS 2261	Intro to Java Programming I	4	MAT 1520	Calculus for Engineering	4
CIS 2271	Java Programming	4	If required:		
Select one:			CIS 2262	Intro to Java Programming II	2
MAT 1221	Finite Mathematics	3			
MAT 1420	Technical Mathematics	5			
		17-19			13-16

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
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	ENG 2080	Technical Communication	3
ELEXXXX	AH/SS elective	3	MAT 2021	Statistics	3
Select one:			SCIXXXX	Science elective	4
BUS 2020	Principles of Management	3			
MAT 1520	Calculus for Engineering	4			
PHI 1030	Introduction to Logic	3			
		16-17			17

Bachelor of Science in Computer Software Engineering

Graduates of this program develop programming expertise and experience significant technical depth in multiple areas. Typical jobs for graduates might include test engineer, release engineer, or customer support engineer. Students may continue on to a Bachelor of Science Degree in Software Engineering, which adds an understanding of software development and significantly more technical depth.

Students with a Bachelor of Science in Computer Software Engineering should be able to meet all the outcomes of the associates program, as well as:

- Understand the behaviors and implementation of computer networking and be able to 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 be able to work with an operating system using administrative tools
- Develop significant technical depth in additional areas approved by the department chair
- Understand the professional, historical, and social context of information technology and be able to make reasoned judgments about the social and ethical implications of their actions

In addition, all graduates 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 his or her background and needs that still satisfies the degree requirements. The typical curriculum taken by students is given below.

The minimum number of credits required for the degree is 121.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
CIS 1120	Intro to Information Technology	3	CIS 1152	Advanced Website Design	3
CIS 1151	Website Design	3	CIS 2151	Computer Networks I	4
ENG 10XX	English	3	ELEXXXX	AH/SS elective	3
INT 1000	Freshman Seminar	1	Select one:		
Select one:			MAT 2120	Discrete Structures	3
CIS 2261	Intro to Java Programming I	4	MAT 1520	Calculus for Engineering	4
CIS 2271	Java Programming	4	If required:		
Select one:			CIS 2262	Intro to Java Programming II	2
MAT 1221	Finite Mathematics	3			
MAT 1420	Technical Mathematics	5			

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
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	ENG 2080 Technical Communication	3
ELE XXXX	AH/SS elective	3	MAT 2021 Statistics	3
Select one:			SCIXXXX Science elective	<u>4</u>
BUS 2020	Principles of Management	3		
MAT 1520	Calculus for Engineering	4		
PHI 1030	Introduction to Logic	<u>3</u>		
		16-17	17	

Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
CIS 3030	Programming Languages	3	CIS 3XXX Upper level CIS elective	3
CIS 3050	Algorithms/Data Structures	3	CIS 3010 Database Systems	4
SCIXXXX	Science elective	4	ELE 3XXX Upper level AH/SS elective	3
Select one:			Select one:	
BUS 4310	Information Architecture	3	BUS 2230 Principals of Marketing	3
CIS 3XXX	Upper level CIS elective	3	BUS 2440 Business Law	3
MAT 2532	Calculus II	4	Select one:	
Select one:			CIS 3312 Systems Development Eng I	3
CIS 3311	Systems Development Eng I	3	CIS 4120 Systems Analysis	<u>3</u>
CIS 4150	Software Engineering	<u>3</u>		
		16-17	15	

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
CIS 4020	Operating Systems	4	BUS 4530 Technical Project management	3
CIS 4721	Senior Project I	2	CIS 4722 Senior Project II	3
HUM 2060	Cyberethics	3	ELEXXXX AH/SS elective	3
Select one:			Select two:	
CIS 4030	GUI Programming	3	CIS 3/4XXX CIS program elective	<u>3</u>
CIS 4140	Human Computer Interface	3		
CIS 4210	Computer Graphics	3		
Select one:				
CIS 3XXX	Upper level CIS elective	3		
ELT 3XXX	Upper level ELT elective	3		
MAT 3720	Topics in Discrete Math	<u>3</u>		
		12	15	

Construction Management

This program is designed to serve both recent high school graduates with limited experience in the construction field and adults already employed in the building industry who want to prepare themselves for project management and supervisory roles.

The first year of the program focuses on the skills entailed in the practice of building construction. In addition to the materials and methods of residential and light commercial construction, students study drafting, print reading, electrical and mechanical systems, math, and physics.

In the second year of the program, students acquire the management skills needed for supervisory positions in the building industry. Second-year students take courses in construction project management; estimating; field engineering and surveying; small business management and business law; and basic structural engineering and safety.

Graduates of the program qualify for a range of positions in the construction field: small business owners, building materials representatives, construction supervisors, estimators, and entrepreneurs. Some students may decide to further their education in management, architectural, or civil engineering. Graduates who expect to run their own construction companies are encouraged to explore continuing their educational path in Vermont Tech's bachelor's degree program.

Students with an Associate of Applied Science in Construction Practice and 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 TotalStation to establish points, elevations, survey distances, building, and road layout
- Write a business plan
- Complete quantity takeoffs in residential and commercial construction

The normal number of credits required for the associate degree is 69.

First Year

Fall Semester

CPM 1000	Freshman Seminar	1
CET 1031	Engrng/Survey Comp Apps I	3
CPM 1021	Construction Graphics I	1
CPM 1031	Residential Construction Systems	3
CPM 1032	Construction Lab	2
ENG 10XX	English	3

Select one:

MAT 1100	Mathematics for Technology	3
MAT 1420	Technical Mathematics	5

16-18

Spring Semester

CPM 1010	Electrical/Mechanical Systems	3
CPM 1022	Construction Graphics II	1
CPM 1111	Commercial Constr Systems	4
MAT 1210	Principles of Mathematics	3
PHY 1030	General Physics	4
ELEXXXX	AH/SS elective	3

18

Summer Semester

CPM 2801	Summer Internship	0
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Second Year

Fall Semester

ACC 1020	Survey of Accounting	3
BUS 2440	Intro to Business Law	3
CPM 2010	Construction Estimates	3
CPM 2020	Construction Project Mgmnt	3
CPM 2050	Construction Mgmnt Software	2
CPM 2060	Field Engineering	3
CPM 2802	Internship Review	1

Optional:

CPM 2720	Construction Supervision	1
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18-19

Spring Semester

BUS 2210	Small Business Management	3
CPM 2030	Elementary Theory of Structures	4
CPM 2730	Construction Seminar & Project	4
ENG 2080	Technical Communication	3
ELEXXXX	AH/SS elective	3

17

Bachelor of Science in Construction Management

We offer a 2+2 construction management baccalaureate program for graduates from the Vermont Tech Architectural and Building Engineering, Civil and Environmental Engineering, and Construction Management programs. Graduates of other similar programs may request a transcript review during the application process.

A baccalaureate degree in Construction Management will meaningfully synthesize prior experiences, education, business management skills, construction techniques, resource allocation, asset management, and human resource management. Students entering from AET, CET, and CPM will arrive with a solid understanding of the foundations of engineering, management, and/or design and will leave with the ability to manage the planning and implementation of a construction project as principal or employee of a construction business. Because of demographics and economics, motivated graduates will enjoy rapid ascent of the management career ladder.

This program is designed to better meet the needs of the construction industry. Rapid technological advances in this field, combined with an aging workforce, have present opportunities for recent college graduates. With additional field experience, graduates will assume positions of superintendent, project manager, estimator, or field engineer in commercial, institutional, industrial, residential, or civil construction.

Specific program objectives, including career and learning outcomes for students include:

Program Goals:

- To prepare students with strong technical and problem-solving backgrounds for management level positions
- To enable students to control or contribute to a profitable construction-related business
- To equip future employees with the skills necessary to adapt to technological and process changes in a rapidly developing field
- To instill resiliency, lifelong learning, and a “no excuses” mentality

Learning Outcomes:

- 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 live saving care (CPR) to other employees
- Evaluate multiple choices in the means and methods of construction for fiscal decision-making and planning

The minimum number of credits required for a degree is 120.

Third Year

For Students from Construction Track

<i>Fall Semester</i>		<i>Spring Semester</i>		
AHS 2035	Advanced First Aid	2	BUS 2410 Human Resource Management	3
CET 3130	Environmental Soils	3	CET 1032 Engrng/Survey Computer Apps II	3
ELEXXXX	AH/SS elective	3	CPM 3010 Construction Estimates II	3
MAT 1420	Technical Mathematics*	5	CPM 3020 Construction Documents	3
			CPM 3030 Concrete & Steel Lab	2
			PHY 1041 Physics I	4
		14		17

For Students from Civil or Architectural Tracks

<i>Fall Semester</i>		<i>Spring Semester</i>		
ACC 2121	Financial Accounting	3	BUS 2410 Human Resource Management	3
AHS 2035	Advanced First Aid	2	CPM 3010 Construction Estimates II	3
BUS 2210	Small Business Management	3	CPM 3020 Construction Documents	3
BUS 2440	Business Law	3	CPM 3030 Concrete & Steel Lab	2
CPM 2010	Construction Estimates	3	ELEXXXX AH/SS elective	3
CPM 2020	Project Management	3		
		16		15

Summer Semester (optional)

CPM 4801	Summer Internship	0
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Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
BUS 2260	Financial Management	3	BUS 2230 Small Business Marketing	3
CPM 4010	Contract Negotiations	3	CPM 4110 Construction Permits	3
CPM 4020	Advanced Field Engineering	3	CPM 4120 Project Planning & Finances	3
CPM 4030	Construction Safety/Risk Mgmnt	3	CPM 4130 Construction Superintendency	3
CPM 4802	Internship Review	1		
ELE 3XXX	Upper level AH/SS elective	3		
		16		12

**Students who have completed MAT 1420 do not have to take MAT 1100 or MAT 1210*

Note: Students in this program are required to have safety glasses; work boots; speed or combo square; chalk line; a tool belt; tape measure; utility knife; and pencils.

Dairy Farm Management Technology

Graduates of this program possess the skills and knowledge needed to operate a modern dairy farm. They frequently return to their home farms, are employed as herd managers, or work as breeding technicians, DHIA testers, and Peace Corps volunteers.

The college's 500 acre working farm and registered Holstein and Brown Swiss herd are integrated into all facets of the program and students are active participants in the management and operation of the farm. Practical experience at the farm is an especially valuable aspect of the program for students who lack a farm background. Additional coursework in accounting, finance, and computer applications help broaden students' understanding of Dairy Farm Management.

Students may also apply for admission to the Farm and Agricultural Resource Management Stewards (FARMS) program offered in cooperation with the University of Vermont. FARMS students make a seamless transition from dairy farm management at Vermont Tech to a second two years at the College of Agriculture and Life Sciences at the University of Vermont. Full-tuition scholarships are available to Vermont students in the FARMS Program.

Students who complete a degree in Dairy Farm Management Technology can transfer seamlessly into the bachelor's program in Business, Diversified Agriculture, or Sustainable Design & Technology.

Students with an Associate of Applied Science in Dairy Farm Management will be able to:

- Understand dairy cow nutrition and the ration formulation process
- Understand dairy cow reproduction and genetics and be able to 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

The normal number of credits required for the degree is 66.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
ACC 1020	Survey of Accounting	3	AGR 1012 Agricultural Techniques II	1
AGR 1011	Agricultural Techniques I	2	AGR 1030 Animal Reproduction & Genetics	3
AGR 1050	Livestock Production	3	AGR 2030 Animal Nutrition	4
CIS 1080	Intro Spreadsheet/Db Mgmt	2	ENG 2080 Technical Communication	3
ENG 10XX	English	3	LAH 1050 Introduction to Soils	4
Select one:			ELEXXXX AH/SS elective	<u>3</u>
MAT 1210	Principles of Mathematics	3		
MAT 1221	Finite Mathematics	3		
MAT 1420	Technical Mathematics	5		
<i>16-18</i>				<i>18</i>

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
AGR 2011	Dairy Herd Management I	3	AGR 2012 Dairy Herd Management II	3
AGR 2020	Farm Buildings	2	AGR 2050 Large Animal Diseases	3
AGR 2040	Forage Production	3	BUS 2210 Small Business Management	3
AGR 2720	Issues & Trends in Agriculture	2	BUS 2230 Principles of Marketing	3
BUS 2260	Principles of Financial Mgmt	3	ELEXXXX AH/SS elective	<u>3</u>
Select one:				
CHE 1020	Introduction to Chemistry	4		
CHE 1031	General Chemistry	<u>4</u>		
<i>17</i>				<i>15</i>

Dental Hygiene

Graduates of this program work directly with dental patients to promote optimum oral health. The dental hygiene profession is primarily educational and preventative in nature and offers opportunities to work in a variety of health care settings, including general and specialty dental practices, community health agencies, and public schools. In addition, graduates may wish to pursue a bachelor's degree, which will provide opportunities to work in alternative settings such as public health, education, research, and dental sales.

All dental hygiene professional courses must be taken in the prescribed four 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.

All students completing the program will be eligible to apply to participate in licensing examinations.

Students with an Associate of Science in Dental Hygiene will be able to:

- Competently perform the role of a dental hygienist in varied situations and settings
- Have the functional acuity and rationale for performing dental hygiene 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 health care team
- Have a basic knowledge of legal responsibilities and ethical considerations of patient care
- Develop a commitment to continuous and lifelong learning

The normal number of credits for the associate degree is 72.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
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	4	DHY 1022	Oral Tissues II/Medical Emergencies	3
DHY 1021	Oral Tissues I	3	DHY 1030	Dental Radiology	3
ENG 10XX	English	3	PSY 1010	Introduction to Psychology	3
		17			18

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
BIO 2120	Elements of Microbiology	4	DHY 2210	Community Oral Health	3
DHY 2010	Dental Materials	3	DHY 2220	Oral Pathology	2
DHY 2020	Pathology & Pharmacology	3	DHY 2722	Clinical Dental Hygiene III	6
DHY 2030	Periodontics	3	ENG 2080	Technical Communication	3
DHY 2721	Clinical Dental Hygiene II	5	MAT 1040	Mathematics for Allied Health	2
			ELEXXXX	AH elective	3
		18			19

Note: All DHY/BIO courses must be completed with a grade of "C" or better to continue in the program

Bachelor of Science in Dental Hygiene

Graduates of this bachelor's program have access to more educational and career opportunities than students who have only completed an associate degree in Dental Hygiene. Career areas where the advanced degree would be advantageous include jobs in dental hygiene research, sales, public health, and education.

Current Vermont Tech students may continue into the bachelor's degree program with departmental approval and do not have to make the decision until the spring of the sophomore year. Students will complete the bachelor's level curriculum through a combination of on-line and transfer courses. Students have six years to complete the required courses for the bachelor's degree.

The Vermont Tech Bachelor of Science degree program holds articulation agreements with Quinsigamond Community College, Community College of Rhode Island, Tunxis Community College, Mount Wachusett Community College, Bristol Community College, and the New Hampshire Technical Institute associate degree dental hygiene programs. These agreements are designed to maximize the number of credits students will be able to transfer to Vermont Tech. Specific details regarding these agreements can be obtained by contacting Vermont Tech's Department of Dental Hygiene at (802) 879-5643.

Intended outcomes for the Dental Hygiene degree completion program are to:

- Provide a vehicle in which graduates of the associate degree program may earn a bachelor's degree while employed as practitioners or full-time students
- Provide opportunities for students to explore various occupational settings such as public health, education, sales, and research
- Prepare graduates for further study at the graduate level
- Broaden the student's knowledge base and education experience in dental hygiene and general education courses
- Provide students with knowledge to develop skills in critical thinking and evidence-based research while fostering life-long learning

The minimum number of credits for the degree is 120.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
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	4	DHY 1022	Oral Tissues II/Medical Emergencies	3
DHY 1021	Oral Tissues I	3	DHY 1030	Dental Radiology	3
ENG 10XX	English	3	PSY 1010	Introduction to Psychology	3
		17			18

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
BIO 2120	Elements of Microbiology	4	DHY 2210	Community Oral Health	3
DHY 2010	Dental Materials	3	DHY 2220	Oral Pathology	2
DHY 2020	Pathology & Pharmacology	3	DHY 2722	Clinical Dental Hygiene III	6
DHY 2030	Periodontics	3	ENG 2080	Technical Communication	3
DHY 2721	Clinical Dental Hygiene II	5	MAT 1040	Mathematics for Allied Health	2
			ELEXXXX	AH elective	3
		18			19

Third Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
DHY 3010	Evidence-Based Decision Making	3	CHE 1020	Introduction to Chemistry	4
DHY 3015	Issues in Dental Hygiene	3	CIS XXXX	IT elective	2-4
ELEXXXX	AH/SS elective	3	DHY 3020	Advanced Periodontics	3
PSY 1050	Human Growth/Development	3	DHY 3030	Educational Methods/Leadership	3
		12			12-14

Fourth Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
DHY 4010	Adv Community Oral Health	3	DHY 4810	Practicum	6
ELEXXXX	AH/SS elective	3	ELE3XXX	Upper level AH/SS elective	3
Select one:			POSXXXX	Political science elective	3
HUM 2020	Bioethics (AH)	3			
PHI 1040	Introduction to Ethics (AH)	3			
Select one:					
XXXXXXXX	Critical thinking elective	3			
MATXXXX	Mathematics elective	3			
		12			12

Note: 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 3XXX level.

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

Diesel Power Technology

The associate degree program in Diesel Power Technology answers an increasing need for skilled diesel service technicians for the growing agricultural, heavy-duty truck, and earth-moving equipment service industry. Graduates are prepared to enter the repair, parts, or management aspects of the diesel power service industry. Job categories include general repair technician, parts professional, service advisor, and, with experience, specialty or lead technician, parts manager, or service manager. Self employment is also possible and a small business management course is included in the curriculum. Graduates are currently employed by Milton Cat, Ryder Truck Rental Systems, Woods CRW, Sheldon Mack/Volvo, Champlain Valley Equipment, R.R. Charlebois Inc., Clarke's Truck Center, J & B International, VTrans, and Engweer's Construction Inc.

The program covers all significant skill areas of the repair industry and includes modules on parts and supplies acquisition, record keeping, customer relations, and preventive maintenance. Electronic control of mechanical systems, system design considerations, and the analysis and diagnosis of system failures are examined through the coursework. Students are exposed to agricultural equipment, earth-moving equipment, and heavy-duty trucks and have the opportunity to work part time at local service providers. A 400 hour summer internship is included which provides students with production experience and an opportunity to assess future employment possibilities.

The coursework covers all systems down to the component level on agricultural equipment, earth-moving equipment, and heavy-duty trucks. All mechanical systems are covered in the curriculum. Electrical, electronic, and hydraulic systems maintenance, diagnosis, and repair are emphasized. A combination of classroom instruction and hands-on laboratory practical experience is used at a one-to-one ratio. Students must possess their own set of hand tools for use in the laboratory and for the summer internship program. A tool list is available from the admissions department or the DPT department.

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

Students with an Associate of Applied Science in Diesel Power Technology should be able to:

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

Coursework in English and technical communication, computer software skills, technical math, physics, small business management, and general education are also included. The program is delivered in a well-equipped 10,000 sq. ft. industrial space within walking distance of the Randolph Center campus.

The normal number of credits required for degree is 63.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
DSL 1010	Steering, Suspension, & Alignment	4	CIS 1080	Intro to Spreadsheet/Db Mgmt	2
DSL 1040	Diesel Electrical/Electronic Systems	4	DSL 1020	Diesel Power Systems	4
ENG 10XX	English	3	DSL 1050	Preventive Maintenance	3
MAT 1100	Introduction to Tech Math	3	DSL 1110	Heavy Duty Braking Systems	3
			PHY 1030	General Physics	4
		14			16

Summer Semester

DSL 2801	Summer Internship	0
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Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
BUS 2210	Small Business Management	3	DSL 2020	Chassis Electrical/Electronic Sys	4
DSL 2010	Fuel Systems	4	DSL 2040	Power Transmission	3
DSL 2030	Hydraulics	3	DSL 2060	Fabrication	3
DSL 2802	Internship Review	1	ELEXXXX	AH/SS elective	3
ENG 2080	Technical Communication	3	ELEXXXX	Elective	3
ELEXXXX	AH/SS elective	3			
		17			16

Bachelor of Science in Diversified Agriculture

Graduates of this program will be well-prepared to own or manage small farms with diverse operations such as dairy, livestock (*e.g.* beef, sheep, and goats), succession grazing, market gardening, greenhouse production, and maple sugaring or to be consultants to agricultural organizations looking to diversify their operations and opportunities.

The Diversified Agriculture program combines animal, plant, and soil sciences with a knowledge and understanding of business and management. The program emphasizes the use of synergistic biological processes to foster a reduction in the need for, and subsequent use of, off-farm inputs. Instruction focuses on practical application of agricultural science in Vermont.

Today's farmers and agricultural industries must compete for customers on an international level while simultaneously meeting an increased demand for locally grown products. Training farmers to develop and synergize diverse agriculture operations on the same farmstead will make them stronger all-around competitors in the food production market, as well as more economically sound.

Students 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 be able to 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 two 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

The minimum number of credits required for a degree is 122.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
ACC 1020	Survey of Accounting	3	AGR 1012 Agricultural Techniques II	1
AGR 1011	Agricultural Techniques I	3	AGR 2030 Animal Nutrition	4
AGR 1050	Livestock Production	3	BIO 1220 Botany	4
CIS 1080	Intro Spreadsheet/Db Mgmt	2	LAH 1050 Introduction to Soils	4
ENG 10XX	English	3	Select one:	
LAH 1020	Introduction to Horticulture	3	MAT 1221 Finite Mathematics	3
			MAT 1210 Principles of Mathematics	3
		17		16

Second Year

<i>Fall Semester</i>				<i>Spring Semester</i>	
AGR 2720	Issues/Trends in Agriculture	2	CHE 2060	Organic Chemistry	4
BUS 2210	Small Business Management	3	ENG 2080	Technical Communication	3
CHE 1031	General Chemistry	4	Select one:		
Select as desired:			MAT 2021	Statistics	3
AGR 1061	Burls to Boards	3	MAT 1420	Technical Mathematics	5
AGR 2011	Dairy Herd Management	3	MAT 1520	Calculus for Engineering	4
AGR 2020	Farm Buildings	3	Select as desired: (6 credits minimum)		
AGR 2040	Forage Production	3	AGR 1030	Reproduction & Genetics	3
BIO 2040	Entomology	3	AGR 2012	Dairy Herd Management	3
MEC 1020	Manufacturing Processes	<u>2</u>	BIO 2030	Plant Pathology	<u>3</u>
				<i>16-18</i>	

Third Year

<i>Fall Semester</i>				<i>Spring Semester</i>	
BUS 2260	Financial Management	3	AGR 3050	Adv Nutrient Management	3
ELE 2XXX	AH/SS elective	3	AGR 3111	Vegetable/Fruit Production I	3
Select as desired: (7 credits minimum)			ELE 2XXX	AH/SS elective	3
AGR 3020	Adv Livestock Production	3	ELE 2XXX	AH/SS elective	3
AGR 3030	Advanced Dairy Nutrition	3	Select as desired: (6 credits minimum)		
AGR 3110	Apples, Berries, & Bees	3	AGR 2050	Large Animal Disease	3
BIO 1020	Environmental Biology	4	AGR 2060	Beef Production	3
LAH 1030	Woody Ornamentals	3	AGR 3040	Maple Production	<u>3</u>
LAH 2020	Plant Propagation	<u>3</u>			
				<i>13-15</i>	<i>16-18</i>

Summer Semester

AGR 4801	Summer Internship	0
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Fourth Year

<i>Fall Semester</i>				<i>Spring Semester</i>	
AGR 4040	Agricultural Products	3	AGR 4720	DAG Project	3
AGR 4802	Internship Review	1	BUS 2230	Principles of Marketing	3
ELE 3XXX	Upper level AH/SS elective	3	SDT 3010	Mediation & Communication	3
Select two:			ELEXXXX	AH/SS elective	3
AGR 2110	Sheep Production	2	Select one:		
ATT 1020	Engine Diagnostics/Repair	4	ATT 1040	Auto Electrical Systems	4
DSL 1020	Diesel Power Systems	4	EQS 4110	Equine Health & Disease	3
SDT 3111	Energy Systems/Sustainability	3	LAH 1040	Greenhouse Management	<u>4</u>
SDT 4112	Green Sites Survey	<u>3</u>			
				<i>13-15</i>	<i>15-16</i>

Electrical Engineering Technology

Graduates of this program are able to work in any number of challenging positions. As engineering technicians, they may participate in such varied activities as research, development, design, production, or manufacturing of complex electrical, electronic, or electromechanical products. Testing, quality control, marketing, installation, and customer service are among the job opportunities available.

Students may also pursue a dual major with Computer Engineering Technology or Mechanical Engineering Technology. Upon completion of a two year Associate Degree in Electrical Engineering Technology, students may pursue a bachelor's degree in Electrical Engineering, Electromechanical Engineering, Sustainable Design & Technology, or Business Technology & Management.

The Associate of Engineering in Electrical Engineering Technology program will:

- Provide students with the capabilities to be immediately employable and productive in the workplace
- Provide the education so that graduates are knowledgeable in both theory and application
- Instill the necessary skills so that graduates are qualified for positions of responsibility
- Provide the base of knowledge so that graduates are prepared for lifelong learning and can adapt to new and emerging technologies
- Provide the base of knowledge so that graduates can continue their formal education

Students with an Associate of Engineering in Electrical Engineering Technology should be able to demonstrate:

- An appropriate mastery of the knowledge, techniques, skills, and modern tools of electrical engineering technology
- The ability to apply basic current knowledge of the electrical, computer, and software engineering fields and adapt this knowledge to emerging applications of mathematics, science, engineering, and technology
- The ability to apply creativity in the design of products (systems, components, or processes) appropriate to EET objectives
- The ability to function effectively on teams
- The ability to identify, analyze, and solve technical problems
- The ability to communicate effectively
- The recognition of the need for and the ability to engage in lifelong learning by researching, reading, and understanding relevant documents
- The ability to understand professional, ethical, and social responsibilities
- A respect for the diversity and knowledge of contemporary professional, societal, and global issues
- A commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The normal number of credits required for the degree is 71.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ELT 1031	Electrical Circuits I	4	CIS 2025	C Programming	4
ELT 1051	Presentation Graphics I	1	ELT 1032	Electrical Circuits II	4
ELT 1110	Intro to Digital Circuits	4	ELT 1052	Presentation Graphics II	1
ENG 10XX	English	3	MAT 1520	Calculus for Engineering	4
INT 1000	Freshman Seminar	1	Select one:		
MAT 1420	Technical Mathematics	<u>5</u>	PHY 1041	Physics I	4
			PHY 2041	Physics I with Calculus	<u>4</u>
		18			17

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ELT 2050	Microcomputer Techniques	4	ELT 2052	Electronics II	4
ELT 2051	Electronics I	4	ELT 2130	Industrial Electronics	4
ELT 2060	Electronic Applications	4	ELT 2720	Electrical Project	3
ELE XXXX	AH/SS elective	3	ENG 2080	Technical Communication	3
Select one:			ELE XXXX	AH/SS elective	<u>3</u>
PHY 1042	Physics II	4			
PHY 2042	Physics II with Calculus	<u>4</u>			
		19			17

Bachelor of Science in Electrical Engineering Technology

Electrical Engineering Technology is a locally and nationally recognized degree. Engineering graduates are involved in a wide spectrum of activities, from software design to the assembly of complex control systems. Graduates with the Bachelor of Science in Electrical Engineering Technology program will have the technical and managerial skills necessary to enter careers in the design, application, installation, manufacturing, operation, and/or maintenance of electrical/electronic systems. In addition to having strengths in the building, testing, operation, and maintenance of existing electrical systems, graduates will be well prepared for development and implementation of electrical/electronic systems. They will be able to take on the role of engineers and senior technicians in the design and manufacture of complex systems, as well as field support and customer service inquiries. Graduates will have the skills, technical experience, and capabilities necessary to succeed in the workplace.

Recent Vermont Tech graduates are involved in alternative energy, chip production/design, aviation, and many other fields.

For the first two years of the program, students will follow the same curriculum as the Associate of Engineering in Electrical Engineering Technology program. For the “plus two” portion of the curriculum, students will broaden and deepen their knowledge in the areas of mathematics; physics; arts and humanities; social sciences, electromechanical systems, programming, and advanced electrical design.

The Bachelor of Science in Electrical Engineering Technology program will:

- Provide students with the capability to be immediately employable and productive in the workplace
- Provide the educational foundation so that graduates are knowledgeable in both theory and application, with the ability to analyze, design, and implement electrical and electronic systems and products
- Qualify graduates for positions of responsibility with the ability to apply project management techniques to electrical/electronic systems
- Instill the need for creativity in the design of systems, components, or processes by having students research and develop multiple solutions to problems and use a variety of tools and techniques in their work
- Prepare graduates for lifelong learning and adaptation to new and emerging technologies
- Provide the base of knowledge so that graduates can continue their formal education

Students with a Bachelor of Science in Electrical Engineering Technology should be able to demonstrate:

- An appropriate mastery of the knowledge, techniques, skills, and modern tools of electrical engineering
- The ability to apply basic current knowledge of the electrical, computer, and software engineering fields and to adapt this knowledge to emerging applications of mathematics, science, engineering, and technology
- The ability to conduct, analyze, and interpret experiments and to apply experimental results to improve processes
- The ability to apply creativity in the design of products (systems, components, or processes) appropriate to EET objectives
- The ability to function effectively on teams
- The ability to identify, analyze, and solve technical problems
- The ability to communicate effectively
- The recognition of the need for and an ability to engage in lifelong learning by researching, reading, and understanding relevant documents
- The ability to understand professional, ethical, and social responsibilities
- A respect for diversity and knowledge of contemporary professional, societal, and global issues
- A commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The minimum number of credits required for the degree is 135.

Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ELM 3015	Sensors & Instrumentation	3	ELT 2061	Electromechanical Systems I	4
ELT 3010	Digital Circuits II	4	ELT 3040	Electronic/Data Communications	4
ELT 3053	General Electronics III	4	ELT 3050	Microprocessor Techniques II	4
MAT 2532	Calculus II	4	MAT 3170	Applied Math for Engineers	3
ELE.XXXX	AH/SS elective	3	ELE 3XXX	Upper level AH/SS elective	3
		18			18

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>			
ELM 4015	Electromech Power Systems	4	ELM 4232	Control Systems II	4
ELM 4231	Control Systems I	4	ELT 4020	Digital Signal Processing	3
ELM 4701	EET Project I	2	ELT 4702	EET Project II	3
ELE.XXXX	Technical elective	3-4	PHY 3120	Intro to Modern Physics	4
		13-14			15

Note: 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.

Bachelor of Science in Electromechanical Engineering Technology

Graduates of this program bridge the traditional gap between engineering disciplines via an interdisciplinary program that emphasizes problem-solving in a design and manufacturing environment where the challenges are both mechanical and electrical. Successful students are prepared to bring this broader understanding to the design, development, manufacturing, and technical support of emerging products, integrating and improving both the product and the process. In larger firms, this might be as a member of the design or manufacturing team, while smaller companies might assign this role to a single individual.

The ELM program is the second leg of a “two-plus-two” curriculum. The junior year offers courses in advanced math, science, and sensor technology, along with “crossover” courses that vary according to a student’s prior educational background.

The Bachelor of Science in Electromechanical Engineering Technology program will:

- Provide students with the capabilities to be immediately employable and productive in the workplace
- Provide the education so that graduates are knowledgeable in both theory and application with the ability to analyze, design, and implement electrical/electromechanical systems and products
- Qualify graduates for positions of responsibility with the ability to apply project management techniques to electrical/electromechanical systems
- Instill the need for creativity in the design of systems, components, or processes by having students research and develop multiple solutions to problems and use a variety of tools and techniques in their work
- Prepare graduates for lifelong learning and adaptation to new and emerging technologies
- Provide the base of knowledge so that graduates can continue their formal education

Students with a Bachelor of Science in Electromechanical Engineering Technology should be able to demonstrate:

- An appropriate mastery of the knowledge, techniques, skills, and modern tools of electromechanical engineering
- The ability to apply basic current knowledge of the electrical, mechanical, computer, and software engineering fields and to adapt this knowledge to emerging applications of mathematics, science, engineering, and technology
- The ability to conduct, analyze, and interpret experiments and to apply experimental results to improve processes
- The ability to apply creativity in the design of products (systems, components, or processes) appropriate to ELM objectives
- The ability to function effectively on teams
- The ability to identify, analyze, and solve technical problems
- The ability to communicate effectively
- The recognition of the need for and an ability to engage in lifelong learning by researching, reading, and understanding relevant documents
- The ability to understand professional, ethical, and social responsibilities
- A respect for diversity and knowledge of contemporary professional, societal, and global issues
- A commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The minimum number of credits required in the junior and senior years is 66 (135 total).

Third Year EET

<i>Fall Semester</i>		<i>Spring Semester</i>		
ELM 3015	Sensors & Instrumentation	3	ELT 2061 Electromechanical Systems I	4
MAT 2532	Calculus II	4	MAT 3170 Applied Math for Engineers	3
MEC 1011	Design Communications I	2	PHY 3120 Intro to Modern Physics	4
MEC 2010	Fluid Mechanics & Fluid Systems	4	MEC 2065 Dynamics & Kinematics	4
MEC 2035	Statics & Strength of Materials	<u>3</u>	MEC 3020 Manufacturing Processes/Machine Dsn	<u>3</u>
		16	18	

Fourth Year EET

<i>Fall Semester</i>		<i>Spring Semester</i>		
ELM 4015	Electromech Power Systems	4	ELM 4232 Control Systems II	4
ELM 4231	Control Systems I	4	ELM 4702 ELM Project II	3
ELM 4701	ELM Project I	2	ELM 3040 Electronics/Data Communications	4
ELEXXXX	Technical elective***	3-4	ELEXXXX AH/SS elective	3
ELE3XXX	Upper level AH/SS elective	<u>3</u>	ELEXXXX Technical elective***	<u>3-4</u>
		16-17	17-18	

Third Year MEC

<i>Fall Semester</i>		<i>Spring Semester</i>		
CIS 2025	C Programming	4	ELT 2061 Electromechanical Systems I	4
ELM 3015	Sensors & Instrumentation	3	ELT 2050 Microcomputer Tech for EET	4
ELT 3060	Electrical Circuit Analysis	3	ELT 3030 Solid State Electronics	4
MAT 2532	Calculus II	4	MAT 3170 Applied Math for Engineers	3
			PHY 3120 Intro to Modern Physics	<u>4</u>
		14	19	

Fourth Year MEC

<i>Fall Semester</i>		<i>Spring Semester</i>		
ELM 4015	Electromech Power Systems	4	ELM 4232 Control Systems II	4
ELM 4231	Control Systems I	4	ELM 4702 ELM Project II	3
ELM 4701	ELM Project I	2	ELT 3040 Electronics/Data Communications	4
ELEXXXX	Technical elective***	3-4	ELEXXXX AH/SS elective	3
ELE3XXX	Upper level AH/SS elective*	<u>3</u>	ELEXXXX Technical elective***	<u>3-4</u>
		16-17	17-18	

* General Education requirement 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 the ELM Senior Project courses (ELM 4701 and 4702), and three credits must be at a 3XXX level.

*** Technical electives may be selected from several areas, including computer science, mathematics, and business: CHE 1031, MAT 2533, 2021, 2533, BUS 2210, 2440 and, for EET>ELM track students only, MEC 2050 or 2130.

Note: EET to ELM track courses required of students with two-year electrical/electronic coursework; MEC to ELM track courses required of students with two-year mechanical

Engineering Technology Foundations Track

The Engineering Technology Foundations Track (EFT) is a one-year curriculum that is designed to improve mathematics, science, and study skills for students who are unprepared for the rigors of the Vermont Tech engineering programs. It also has the increased benefit of reducing class load for students in the first semesters of their chosen engineering program.

At Vermont Tech, the engineering programs are quite rigorous and students that do not place into MAT 1420 are required to complete the EFT two-semester sequence prior to entering into the regular engineering degree curriculum.

In addition to the EFT track, students who do not initially place into MAT 1420 may opt to take Summer Bridge prior to the start of their first semester. If math placement has improved after Summer Bridge to the extent that the student can be placed into MAT 1420, they will be allowed directly into the degree curriculum and will not be required to take the EFT.

The Summer Bridge program is an intensive four-week residential program that provides early main campus orientation, preparatory pre-college coursework in mathematics, physics, English, and computer. For more information on Summer Bridge, contact the Admissions office.

First Year

<i>Fall Semester</i>				<i>Fall Semester</i>	
INT 1000	Freshman Seminar	1	ENG 1060	English Composition (if required)	3
INT 0010	Effective Learning*	2	PHY 0100	Basic Physics*	4
ENG 10XX	English	3	Select one:		
MAT 1111	Intro to Tech Math I*	5	MAT 1112	Intro to Tech Math II*	5
Select one:			MAT 1340	Algebra & Trigonometry	5
ARC 1010	Arch Woodframe Construction	3	Select as desired:		
CET 1031	Computer Applications I	3	ARC 1220	Architectural History	3
ELT 1110	Intro to Digital Circuits	4	CET 1020	Engineering Materials	4
MEC 1011	Design Communications I	2	CIS 2025	Fundamentals of Programming	4
			MEC 1012	Design Communications II	3
			ELEXXXX	AH/SS elective	3
		15			15-16

Students may elect to change their engineering program after completion of the EFT track. This is perfectly acceptable and can be done with a change of program form, available at the Registrar's Office.

**Students may not drop these courses without the approval of the Academic Dean*

Bachelor of Science in Equine Studies

Graduates from this program can explore a variety of career opportunities, depending on their areas of interest. The Equine Studies bachelor's degree program is designed for students who are passionate about working with and learning about horses and who want the flexibility to pursue a variety of careers in the broader equine industry. In addition to the traditional careers (barn manager, assistant trainer, or riding instructor), the opportunities for employment are limited only by graduates' imaginations and interests. Providing a solid foundation of business skills and equine knowledge, this program prepares students for success on whatever path they choose to follow.

The core Equine Studies program is a combination of theory and hands-on experience working with horses and clients. Specific equine topics include equine anatomy and disorders; nutrition; genetics and reproduction; training; riding instruction techniques; equine massage; tack selection and fit; therapeutic programs; farrier practices; law for the equine professional, and equitation. Independent study and internships are actively encouraged and facilitated.

Students with a Bachelor of 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
- Recognize, examine, and implement fundamental business theories and practices, including bookkeeping and accounting systems, legal guidelines, and marketing objectives and strategies
- Demonstrate their understanding of issues in the equine industry, eventually presenting their appraisal of and recommendations about a defined area of the industry
- Review, examine, and draw conclusions about scientific theories concerning equine health, behavior, and care

Equine Studies students must provide or arrange for their own transportation to and from the equine facility, which is located seven miles from campus. The program does encourage students to carpool whenever possible.

The minimum number of credits required for the degree is 122.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
BIO 2320	Zoology	4	CHE 1020 Introduction to Chemistry 4
EQS 1011	Intro to Equine Studies I	2	EQS 1012 Intro to Equine Studies II 2
EQS 1031	Stable Management I	2	EQS 1032 Stable Management II 2
EQS 2025	Equitation*	1	EQS 2025 Equitation* 1
ENG 10XX	English	3	LAH 1050 Introduction to Soils 4
Select one:		VET 1020	Animal Anatomy/Physiology 4
MAT 1210	Principles of Mathematics	3	
MAT 1221	Finite Mathematics	3	
Optional:			
EQS 1220	Horse Judging	1	

Summer Semester (optional)

EQS 2801	Summer Internship	0
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Second Year**Fall Semester**

ACC 1020	Survey of Accounting	3
AGR 2040	Forage Production	3
BUS 2210	Small Business Management	3
EQS 2011	Equine Training I	3
EQS 2020	Farrier Care & Lameness	2
EQS 2802	Internship Review (optional)	1
Select one:		
AGR 1050	Livestock Production	3
EQS 2041	Equine Massage I	3
Optional:		
EQS 1220	Horse Judging	1

Spring Semester

AGR 1030	Animal Repro/Genetics	3
AGR 2030	Animal Nutrition	4
ENG 2080	Technical Communication	3
EQS 2025	Equitation*	1
ELEXXXX	AH/SS elective	3
Select one:		
CIS 1050	Intro to Spreadsheets	1
CIS 1080	Intro Spreadsheet/Db Mgmt	2

18-19

15-16

Third Year**Fall Semester**

BUS 2260	Principles of Financial Mgmt	3
EQS 2025	Equitation*	1
EQS 3031	Riding Instruction I	3
ELE3XXX	Upper level AH/SS elective	3
PSY 1010	Introduction to Psychology	3
Optional:		
EQS 1220	Horse Judging	1
EQS 3042	Equine Massage II	3

Spring Semester

ACC 1010	Computerized Accounting	3
BUS 2410	Human Resource Mgmt	3
EQS 3012	Equine Training II	3
EQS 3032	Riding Instruction II	3
Select one:		
MAT 1221	Finite Mathematics	3
MAT 2021	Statistics	3

13-17

15

Fourth Year**Fall Semester**

CIS 1151	Website Design	3
ENG 1070	Effective Speaking	3
EQS 4010	Law/Equine Professional	3
ELEXXXX	AH/SS elective	3
ELEXXXX	Elective	3
Optional:		
EQS 1220	Horse Judging	1
EQS 2025	Equitation*	1

Spring Semester

BUS 2230	Principles of Marketing	3
EQS 4110	Equine Health & Disease	3-4
EQS 4120	Therapeutic Programs	2
EQS 4610	Senior Seminar	3
ELEXXXX	AH/SS elective	3
Optional:		
EQS 2025	Equitation*	1

15-17

15-16

*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

Graduates are prepared to pursue careers in firefighting, fire protection services, and affiliated professions. Some typical career choices for graduates of the Fire Science program include firefighters; emergency medical technicians; fire, police, and ambulance dispatchers; fire suppression and alarm system installers and technicians; and fire inspectors and investigators.

The curriculum includes coursework in fire behavior, emergency medicine, hazardous materials chemistry, incident strategy and tactics, administration of emergency services, fire prevention, and occupational safety and health. The program will also prepare students for certification in both firefighting (Vermont Firefighter I and II) and emergency medicine (EMT-B). As well as preparing students for the fire service, the program will provide strong leadership skills and instill graduates with a sense of community service.

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

- Demonstrate 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 and private 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

The normal number of credits required for the degree is 63.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
CIS 1050	Intro to Spreadsheets	1	CHE 1020 Introduction to Chemistry 4
FSC 1010	Building Construction/Fire Protection	3	FSC 1022 Firefighting Services II 4
FSC 1021	Firefighting Services I	3	FSC 1210 Fire Inspector I 3
FSC 1030	History/Impact of Fire in America	3	FSC 1220 Fire Service Leadership 3
MAT 1210	Principles of Mathematics	3	ELEXXXX AH/SS elective 3
ENG 10XX	English	3	
		16	17

Electives (fall or spring)

FSC 1122	Service Learning	3
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Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
AHS 1011	Emergency Medical Services	6	FSC 2210 Fire Administration 3
ENG 2080	Technical Communication	3	FSC 2220 Firefighting Strategy & Tactics 3
FSC 2020	Hydraulics & Water Supply	3	FSC 2230 HazMat Chemistry/Operations 3
FSC 2250	Fire & Life Safety Educator	3	FSC 2240 Fire Protection Systems 3
		ELEXXXX	AH/SS elective 3
		15	15

Electives (fall or spring)

FSC 2030	Occupational Health & Safety	3
FSC 2820	Residential Internship	3

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

General Engineering Technology

Graduates of this program are generally already employed by a variety of companies and industries seeking workforce development opportunities. 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 students 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.

The minimum number of credits for the degree is 60.

General Education

ENG 1061	English Composition	3
ENG 2080	Technical Communication	3
MAT XXXX	Mathematics elective	3
PHY/CHE/BIO XXXX	Science elective	4
ELE 2XXX	AH elective	3
ELE 2XXX	SS elective	3
		19

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	Communications elective	3
XXX XXXX	Communications elective	3
MAT/SCI XXXX	Advanced math/science elective	3-5
XXX XXXX	Technical elective	3
		18-20

Technical Emphasis Courses

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

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

Landscape Design & Sustainable Horticulture

Graduates of this program are eminently qualified for a wide range of successful careers in landscape design and horticulture such as: landscape designers; contractors and maintenance personnel; greenhouse operators; perennial growers; plant propagators; nursery and garden center operators; arborists; technicians for state and federal regulatory agencies; and horticultural supply reps. Projected job growth is excellent and there is a steady trend toward higher salaries and benefits in this field.

The LDSH program is unique in that it combines the theory and practice of horticultural science and landscape design, construction, and management. The core curriculum features courses such as Woody Ornamentals; Herbaceous Plant Materials; Entomology and Ecological Pest Management; Landscape Graphics; Landscape Design; Greenhouse Management; Landscape Construction; and Plant Pathology.

In addition to the above courses, students take math, English, general education, and a business sequence (accounting, marketing, small business). Graduates from this program are well-prepared to enter today's dynamic horticultural industry or to continue their education at Vermont Tech or at another four-year college or university.

Students with an Associate of Applied Science in Landscape Design and Sustainable Horticulture learn the following competencies:

- **Graphic Communication Skills:** demonstrate an appropriate mastery of freehand sketching, board drafting, presentation graphics, and CADD as effective tools for the formulation, exploration, communication, and presentation of design ideas
- **Communication Skills:** demonstrate a high level of ability to communicate technical and theoretical information effectively to clients, customers, and coworkers, both through the written and spoken word; demonstrate excellent listening and interpersonal skills; demonstrate the principles of professional conduct in all aspects of client/customer and employee/employer relations
- **Technical Skills:** demonstrate a high level of comprehension and the ability to analyze, solve, and apply the following: materials and methods of construction (the respective roles of specifications and drawings; the development of design intentions at the site and detail level; and their resolution according to sound principles of construction; surveying techniques in preparation of a base map; construction of stone walls and patios; statics and mechanics of basic landscape construction materials; and estimating and bidding); site engineering issues such as grading and drainage; the creation and maintenance of healthy plant environments, both indoors and outdoors; legal issues and regulations as they apply to land use, landscape construction, and/or installation; the installation, operation, advantages, and disadvantages of greenhouse and nursery environmental systems; integrated pest management; and the utilization of appropriate computer applications
- **Design Skills:** integrate fundamental design principles and practice, including site analysis; base plan measurements and preparation; and study of historic precedent in order to analyze, create, and apply these concepts to comprehensive and holistic landscape designs. This includes working drawings, presentation drawings, client/jury evaluations, and write-up. This course of study culminates in a proposed master plan project that integrates all aspects of design study
- **Horticultural Skills:** demonstrate a high level of comprehension and the ability to analyze, solve, and apply the following: identification, production, and use of herbaceous and woody ornamental plants; propagation; diagnosis of insect and disease problems and the assimilation of integrated, environmentally safe, and sustainable

approaches for their management; soil properties; and landscape applications such as plant selection, planting and pruning practices, cultural requirements, cultural practices, and maintenance

- **Business Skills:** examine and analyze: practical aspects of organizing and managing a small business; marketing (product, place, pricing, and promotion); management skills. Demonstrate a working knowledge of generally accepted accounting practices as they apply to the horticultural/design industry. Demonstrate a high level of ability in such essential “soft skills” as interpersonal communication, professionalism, and teamwork

The normal number of credits required for the degree is 68.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
CIS 1080	Intro Spreadsheet/Db Mgmt	2	ACC 1020 Survey of Accounting	3
ENG 10XX	English	3	BIO 1220 Botany	4
LAH 1020	Introduction to Horticulture	3	LAH 1050 Introduction to Soils	4
LAH 1021	Landscape Graphics	3	LAH 2011 Intro to Landscape Design	3
LAH 1030	Woody Ornamentals	3	ELEXXXX AH/SS elective	3
MAT 1210	Principles of Mathematics	3		
		17		17
 <i>Summer Semester</i>				
		LAH 2801	Summer Internship	0

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
BIO 2040	Entomology/Ecological Pest Mgmt	3	BIO 2030 Plant Pathology	3
BUS 2210	Small Business Management	3	BUS 2230 Principles of Marketing	3
LAH 2030	Herbaceous Plant Materials	3	ENG 2080 Technical Communication	3
LAH 2802	Internship Review	1	LAH 2720 LAH Seminar	2
ELEXXXX	AH/SS elective	3	ELEXXXX Technical elective	3-4
Select one:		Select one:		
LAH 2010	Landscape Construction/Mgmt	4	LAH 2012 Advanced Landscape Design	3
LAH 2020	Plant Propagation	3	LAH 1040 Greenhouse Management	4
		16-17		18-19

Mechanical Engineering Technology

Graduates of this program are involved in the design, testing, manufacture, installation, maintenance, distribution, and documentation of mechanical systems and devices. They are also well prepared for admission to Vermont Tech's Bachelor of Science in Electromechanical Engineering Technology; Business Technology and Management; or Sustainable Design & Technology program.

Students with an Associate of Engineering in Mechanical Engineering Technology will:

- Gain the knowledge, problem-solving abilities, and hands-on skills to succeed in a career in the manufacturing, design, specification, installation, testing, operation, maintenance, sales, or documentation of mechanical systems
- Employ communication and teamwork skills to effectively form a link between professional engineers and skilled production workers and to assist engineers to design, develop, and manufacture industrial machinery and consumer products
- Apply knowledge and an aptitude for learning to continuously develop new skills and learn about new topics needed for long-term career development, including science, engineering, and technology knowledge and communication and teamwork skills

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

- Exhibit mastery of the knowledge, techniques, skills, and modern tools of mechanical engineering technology
- Apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology
- Conduct, analyze and interpret experiments and apply experimental results to improve processes
- Apply creativity in the design of systems, components, or processes appropriate to program objectives
- Function effectively on teams
- Identify, analyze, and solve technical problems
- Communicate effectively
- Recognize the need for and possess an ability to engage in lifelong learning
- Understand professional, ethical, and social responsibilities
- Respect diversity and have a thorough knowledge of contemporary professional, societal, and global issues
- Exhibit a clear commitment to quality, timeliness, and continuous improvement

The program is accredited by the Engineering Technology Accreditation Commission of the Accreditation Board for Engineering and Technology.

The normal number of credits required for a degree is 69.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ENG 10XX	English	3	ENG 2080	Technical Communication	3
MAT 1420	Technical Mathematics	5	MAT 1520	Calculus for Engineering	4
MEC 1000	Freshman Seminar	1	MEC 1012	Design Communication II	3
MEC 1011	Design Communication I	2	MEC 1040	Intro to Materials Sci/Eng	3
MEC 1020	Manufacturing Processes	2	PHY 1042	Physics II	4
MEC 1050	Computer Apps for Mechanical	1			
PHY 1041	Physics I	4			
		18			17

Second Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
ELT 2071	Basic Electricity	3	ELT 2072	Electronics	4
MEC 2010	Fluid Mechanics/Fluid Systems	4	MEC 2050	Thermodynamics/Heat Transfer	4
MEC 2035	Statics & Strengths of Materials	4	MEC 2065	Kinematics & Dynamics	4
MEC 2040	Computer-Aided Technology	2	MEC 2720	Mechanical Projects	3
ELE.XXXX	AH/SS elective	3	ELE.XXXX	AH/SS elective	3
		16			18

Note: Students desiring PHY 2041/2042 instead of PHY 1041/1042 must make specific arrangements with the department chair.

Nursing

Vermont Tech offers a Practical Nursing (PN) certificate and an Associate of Science Degree in Nursing (ADN) program. These programs are offered at four locations across the state with campuses in Bennington, Brattleboro, Williston, and Randolph Center. Both programs are also offered in a distance learning format at several locations around Vermont.

The PN program extends over two semesters and one summer session. Students learn PN skills through independent study, lectures, demonstrations, and practice in a nursing arts lab. Under instructor supervision, students also provide patient care in a variety of health care settings in neighboring health care agencies.

Upon completion of the program, PN graduates are eligible to apply to take the NCLEX for Practical Nurses. ADN program graduates are awarded an Associate of Science in Nursing and are eligible to apply to take the NCLEX for Registered Nurses. The Vermont State Board of Nursing application requests information regarding past history of substance abuse, prior felony convictions, and failure to pay child support and/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>

After licensure, PN graduates typically find employment in hospitals, nursing homes, and other health care agencies and work under the supervision of a registered nurse, physician, or dentist. With experience, they can assume increasing responsibilities in the nursing field.

The ADN program articulates with the PN program and requires two further semesters of full-time study. The program is selective and rigorous and there is no assurance of admission from the PN program. Additionally, the twelve clinical credits earned in the PN program do not transfer to the ADN program. Vermont Tech also maintains articulation agreements with UVM for their BSN program and with Champlain College for their BS in Healthcare Management.

ADN graduates are prepared to work in a health care setting under the supervision of more experienced practitioners. With experience, they can assume increasing responsibilities and may be responsible for supervising others.

Students with a Certificate in Practical Nursing will be able to:

- Employ the nursing process for selected 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 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 health care 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

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

- Evaluate the plan of care to assist clients with complex health care 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 health care needs
- Demonstrate accountability for growth as individuals, as members of society, and as professional nurses

The normal number of credits required for the certificate is 47; for the degree it's 70.

Certificate in Practical Nursing First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
BIO 1030	Nutrition	3	BIO 2012	Human Anatomy & Physiology II	4
BIO 2011	Human Anatomy & Physiology I	4	NUR 0121	Principles & Practices of Nursing II	4
NUR 0111	Principles & Practices of Nursing I	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
<i>19</i>			<i>19</i>		
 <i>Spring2 Semester**</i> 					
			NUR 0131	Principles & Practices of Nursing III	4
			NUR 1131	Principles & Practices & Nursing III	5
			<i>9</i>		

Associate Degree in Nursing Second Year

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

**** PN students may not enroll in spring or summer courses until after Spring2 courses are complete (see VSC enrollment consortium agreement).**

Note: All BIO and NUR courses and PSY 1050 must be completed with a grade of "C" or better to continue in the program; only 35 credits from the PN program will count toward cumulative credits.

The certificate program includes 495 hours of theory and 630 hours of clinical/lab; the degree program includes 420 hours of theory and 315 hours of clinical/lab.

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.

Professional Pilot Technology

Graduates of this program are prepared for a variety of career opportunities in aviation. Students attain necessary flight credentials for cockpit positions including flight education, corporate flying, charter operations, commuter airline jobs, as well as ultimate positions with main domestic and international air carriers. In addition, students may also qualify for employment in many other aviation industry positions such as managers, dispatchers, simulator trainers, and marketers for aviation or related companies.

The Professional Pilot Technology program provides flight training courses in cooperation with Vermont Flight Academy at the nearby Burlington International Airport. Offered FAA certificates and ratings include: Private, Instrument, Commercial (Single-Engine Land & Sea), Multi-Engine (Land & Sea), and Certified Flight Instructor (Airplane, Instrument, & Multi-Engine). The course work combines both basic and advanced airmanship skills to provide safe operations in all types of flying.

The Bachelor of Science in Aviation: Professional Pilot Technology program will:

- Provide graduates with the academic and professional tools needed to achieve success in the constantly changing aviation industry
- Provide knowledge of contemporary world-wide aviation industry issues
- Provide specific flying skills to attain FAA certificates and ratings that allow for success in all segments of the international aviation industry
- Enhance critical- thinking and decision-making skills necessary for safe and effective flying
- Provide professional preparation, a zeal for life-long learning, with a focus on the development of professional skills enhanced by the technology of aviation and integrated safety practices

Students with a Bachelor's of Science in Aviation: Professional Pilot Technology will

- Demonstrate the theoretical knowledge necessary to attain FAA certificates and ratings in Private, Instrument, Commercial, Flight Instructor, and Multi-Engine
- Demonstrate flight skills and knowledge necessary for attainment of all FAA certificates and ratings offered in the program
- Understand and interpret meteorological data to ensure safe and efficient flight operations
- Operate as a crew member in an aircraft cockpit and function effectively as part of a multi-disciplinary team
- Understand the technological, political, and historical developments constituting the evolution of modern aviation
- Apply aerodynamic, mathematical, and scientific principles to ensure safe and efficient flight operations
- Accurately analyze and interpret data from a variety of sources in all facets of aviation and all types of flying
- Communicate with peers, instructors, superiors, subordinates, and government agencies with precision and clarity

The minimum number of credits required for the bachelor's degree is 121.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
AER 1010	Private Pilot: Ground	3	AER 1032 Aviation Meteorology II	3
AER 1020	Private Pilot: Flight	2	AER 1110 Pilot Instrumentation Rating: Ground	3
AER 1031	Aviation Meteorology I	3	AER 1120 Pilot Instrumentation Rating: Flight	2
MAT 1340	Algebra & Trigonometry	5	PHY 1041 Physics I	4
INT 1000	Freshman Seminar	1		
ENG 10XX	English	3		
		17		15

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
AER 2010	Commercial Pilot: Ground	4	AER 2032 Commercial Pilot: Flight Phase II	3
AER 2031	Commercial Pilot: Flight Phase I	3	AER 2110 Aviation Safety/Accident Investigation	3
AER 2610	Aviation Project I	2	AER 2130 Aviation History	3
AER 2040	Avionics/Instrumentation	3	ENG 2080 Technical Communication	3
BIO 1330	Intro Occupational Physio/Psych	3	ELEXXXX AH/SS elective	3
			CIS 1080 OS, Spreadsheet, Database	2
		15		17

Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
AER 3010	Certified Flight Instructor: Ground	3	AER 3020 Certified Flight Instructor: Airplane	3
AER 3030	Human Factors, Risk Mgmt/CRM	3	AER 3040 AC Maintenance for Pilots	3
BUS 2020	Principles of Management	3	BUS 3250 Organizational Behavior/Mgmt	3
BUS 3410	Business Ethics	3	ELEXXXX AH/SS elective	3
ELE 3XXX	Upper level AH/SS elective	3	MAT 2021 Statistics	3
		15		15

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>		
AER 4010	Multi-Engine Ground/Flight	1	AER 4110 Adv Transport Category Systems	3
AER 4020	CFI: Instrument Ground/Flight	1	AER 4130 High Alt Nav/International Flight Ops	3
AER 4030	CFI: Multi-Engine Ground/Flight	1	AER 4610 Aviation Senior Project	3
AER 4040	Corporate Flying/Aviation Business	3	ELE 3XXX Upper level AH/SS elective	3
AER 4050	Adv Aerodynamics/Flight Controls	3	ELEXXXX Elective	3
BUS 3150	Production & Operations Mgmt	3		
ELE XXXX	Elective	3		
		15		15

Respiratory Therapy

Graduates of this program work to apply scientific principles to prevent, identify, and treat acute or chronic dysfunction of the cardiopulmonary system. Respiratory care includes the assessment, treatment, management, control, diagnostic evaluation, education, and care of patients with deficiencies of the cardiopulmonary system. About 75% of all respiratory therapists work in hospitals or other acute care settings. However, many therapists are employed in clinics, physicians' offices, and skilled nursing facilities

The respiratory therapy program is offered in a distance learning format in two locations in Vermont in collaboration with CCV and health care providers at various locales. Under instructor supervision, students provide patient care in a variety of health care settings in Vermont and New York. All students are required to travel to hospital sites at a distance from their local site.

Graduates are eligible to apply to take the entry-level certified respiratory therapist and advanced-level registered respiratory therapist credential examinations offered by the National Board for Respiratory Care. The program is accredited by the Commission on Accreditation for Respiratory Care.

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

- Meet the respiratory care needs in the health care community and demonstrate the attitudes, skills, and knowledge relevant to their role as registered respiratory therapists
- Decide whether care is needed, administer the care competently, and determine whether the care provided was in fact effective
- Develop critical thinking skills, use strong communication skills, and demonstrate the leadership required of today's respiratory therapists

The normal number of credits required for a degree is 69.

First Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
BIO 2011	Human Anatomy & Physiology I	4	BIO 2012	Human Anatomy/Physiology II	4
ENG 10XX	English*	3	RSP 1012	Respiratory Care II	4
INT 1000	Freshman Orientation	1	RSP 1210	Respiratory Anatomy/Physiology	3
RSP 1010	Intro to Respiratory Therapy	3	RSP 1601	Respiratory Clinical Field Exp I	2
RSP 1011	Respiratory Care I	4			
Select one:**					
MAT 1210	Principles of Mathematics	3			
MAT 1221	Finite Mathematics	3			
MAT 2021	Statistics	3			
		18			16

Summer Course

	RSP 2801	Respiratory Internship	0
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Second Year

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

**Students must place into ENG 1060 or 1061 and achieve a level 2 math placement in order to be accepted into the program*

***Choose from: MAT 1210, MAT 1221, MAT 2021, or others with permission of department; availability depends on scheduling. Students must complete a minimum of one placement level 2 math elective. (May be taken in fall or spring)*

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

Bachelor of Science in Sustainable Design & Technology

Graduates of this program will be prepared to work in technical fields related to their associate degree and to work with newer sustainable technologies as applications engineers, project managers, or technical staff. Sustainable Design Technology graduates will also be prepared to pursue post-baccalaureate education in business, environmental law, or related technical fields and graduates will provide businesses with highly valued employees with a blend of technical and communication skills and knowledge of business.

This is a cross-disciplinary program grounded in the belief that students who understand the fundamentals of technology, business, and the regulations that govern both can be effective agents for sustainable change. The program creates graduates committed to using technology to grow a sustainable economy, act as stewards of our environment and resources, and educate others about the benefits of a more sustainable college and community.

The +2 SDT curriculum emphasizes application of technology in service of sustainable goals and an understanding of the fundamentals of business, regulation, and permitting as well as sustainable application of technologies. The curriculum is organized into four areas: sustainability core, green technical tracks, business electives, and general education. Students select one of three technical tracks: Green Buildings, Green Sites, or Renewable Energy.

The **Green Buildings** track focuses on conserving energy and resources in new and renovated residential and commercial buildings without sacrificing function and design. This track includes all aspects of sustainable design, from green materials and construction to efficient selection and operation of complex mechanical systems. Students learn to evaluate building designs on the basis of natural energy efficiency standards and how to integrate renewable energy systems into buildings. Students enter this track from the Architectural & Building Engineering Technology (ABT) and Construction Management (CPM) programs.

The **Green Sites** track focuses upon the art of responsible, inspired design and engineering for residential, agricultural, and commercial sites in order to enhance the quality, sustainability, and integrity of our built environment. Within this track, special emphasis is placed upon the design of the landscape, including structures, planting, roads, and water systems, in order to minimize environmental impact; meet and create legislative standards; and promote an ethic of stewardship of the land and our natural resources. Students enter this track from the Civil & Environmental Engineering Technology (CET), Dairy Farm Management Technology (DFM), and Landscape Development & Ornamental Horticulture (LAH) programs.

The **Renewable Energy** track focuses on renewable energy technology and systems for efficient energy conversion and use. The technical curriculum includes courses in mechanical and electrical engineering that cover topics such as materials and structures; circuits and electronics; sensors and instrumentation; and electromechanical power systems. Energy systems courses address the use of solar, wind, alternative fuels, and other renewable technologies for electricity, heating, and other power uses. Students enter this track from Electrical Engineering Technology (EET) or Mechanical Engineering Technology (MEC) programs.

Students with associate degrees from other majors may have individualized programs set up based on previous coursework and track requirements.

Students with a Bachelor of Science in Sustainable Design and Technology will:

- Demonstrate a robust understanding of the environmental, climate, and energy challenges facing our state and society and the economic opportunities provided by meeting these challenges
- Apply critical and analytical thinking skills to determine where and when sustainable designs, technologies, and practices are appropriate and effective
- Demonstrate effective communication and be advocates for sustainability and environmental stewardship
- Develop a basic understanding of business, enterprise, and management practices.
- Demonstrate an understanding of the costs and benefits of a more sustainable approach to environmental, technological, economic, and societal issues
- Apply a high level of competence and technical mastery in their chosen green technical track

Students may take Sustainable Design & Technology courses prior to completion of their associate degree if their schedule and prerequisites permit.

The minimum number of credits required for the +2 portion of the degree is 64 (120 total).

For all tracks, the following courses will qualify as business/enterprise elective: any ACC or BUS course at the 2XXX level or higher; AGR 1061, 3040, 3110, and 3111. BUS 2020 and 4530 are strongly recommended.

Green Buildings Track
for Architecture and Construction students

Third Year

Fall Semester

Spring Semester

Core Classes

SDT 3000	SDT Seminar	1
SDT 3111	Energy Systems/Sustainability	3
SDT 4112	Green Sites Survey	3

ABT

ARE 3112	Codes & Loads: Electromech	2
BIO 1020	Intro to Environmental Science	4
ELE 3XXX	Upper level AH/SS elective	3
SDT 3119	Leadership in Energy/Env Design	1

CPM

ARE 2051	Architectural Design I	3
MAT 1520	Calculus for Engineering	4
PHY 1043	Physics for Architectural	3

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Core Classes

SDT 3010	Conflict & Communication	3
ARE 3010	Design Systems Integration	3
ARE 3050	Fluids/Thermodynamics	4

ABT

BUSXXXX	Business elective	3
SDT 4113	Green Bldng Technical Survey	3

CPM

ARE 2032	Environmental Systems II	3
ELE 3XXX	Upper level AH/SS elective	3

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Summer Course

SDT 4801	Summer Internship	0
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Fourth Year

Fall Semester

Spring Semester

Core Classes

ARE 4030	HVAC Systems	4
SDT 3121	SDT Studio I	3
SDT 4110	Building Controls/Commissioning	3
SDT 4802	Internship Review	1

ABT

ARE 4020	Architectural Engineering Mgmt	3
BUS XXXX	Business elective	3

CPM

ARE 3112	Codes & Loads: Electromech	4
BIO 1020	Intro to Environmental Science	4
SDT 3119	Leadership in Energy/Env Design	1

17-18

Core Classes

ARE 3040	Electrical/Lighting Systems	3
CHE 1031	General Chemistry I	4
ELE XXXX	AH/SS elective	3
MAT 2021	Statistics	3
SDT 4122	SDT Studio II	3

ABT

BUS XXXX	BUS elective	3
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CPM

SDT 4113	Green Bldng Technical Survey	3
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* CPM students must complete MAT 1420 before entering the SDT program.

Green Sites Track
for Civil, Dairy, and Landscape students
Third Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
Core Classes		Core Classes	
SDT 3000	SDT Seminar	1	AGR 3050 Advanced Nutrition Management 3
SDT 3111	Energy Systems/Sustainability	3	SDT 3010 Conflict & Communication 3
SDT 3130	Environmental Soils	3	SDT 3020 Environmental Permitting 2
SDT 4112	Green Sites Survey	3	SDT 4113 Green Bldng Technical Survey 3
CET		CET	
AGR 2720	Issues/Trends in Agriculture	2	BUS XXXX Business elective 3
LAH 1020	Intro to Horticulture	3	BUS XXXX Business elective 3
LAH 1021	Landscape Graphics	3	
DFM		DFM	
CET 1031	Engng/Srvyng Comp Apps I	3	CET 1031 Engng/Srvyng Comp Apps II 3
LAH 1021	Landscape Graphics	3	ELE 3XXX Upper level AH/SS elective 3
LAH		LAH	
BIO 1020	Intro to Environmental Science	4	BUS XXXX Business elective 3
CET 1031	Engng/Surveying Comp Apps I	3	CET 1032 Engng/Surveying Comp Apps II 3
		16-18	14-17
			Summer Course
			SDT 4801 Summer Internship 0

Fourth Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
Core Classes		Core Classes	
SDT 3121	SDT Studio I	3	MAT 2021 Statistics 3
SDT 4130	Sensitive Ecosystems	3	SDT 4020 Groundwater/Surface Water 3
SDT 4802	Internship Review	1	SDT 4122 SDT Studio II 3
CET		CET	
BIO 1020	Intro to Environmental Sci	4	BUS XXXX Business elective 3
BUS XXXX	Business elective	3	ELE XXXX AH/SS elective 3
ELE 3XXX	Upper level AH/SS elective	3	
DFM		DFM	
BIO 1020	Intro to Environmental Sci	4	ELE XXXX AH/SS elective 3
LAH 1020	Intro to Horticulture	3	PHY 1030 General Physics 4
LAH		LAH	
AGR 2720	Issues/Trends in Agriculture	2	ELE XXXX AH/SS elective 3
CHE 1020	Introduction to Chemistry	4	PHY 1030 General Physics 4
ELE 3XXX	Upper level AH/SS elective	3	
		16-17	15-16

Renewable Energy Track for Electrical and Mechanical students

Third Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
Core Classes			Core Classes		
BIO 1020	Intro to Environmental Sci	4	BUS XXXX	Business elective	3
ELM 3015	Sensors & Instruments	3	SDT 3010	Conflict & Communication	3
SDT 3000	SDT Seminar	1	SDT 4030	Renewable Energy Systems	3
SDT 3111	Energy Systems/Sustainability	3	SDT 4113	Green Bldng Technical Survey	3
SDT 4112	Green Sites Survey	3			
EET			EET		
BUS XXXX	Business elective	3	ARE 3050	Fndmnts Fluids/Thermodynamics	4
			ELE 3XXX	Upper level AH/SS elective	3
MEC			MEC		
ELE 3XXX	Upper level AH/SS elective	3	BUS XXXX	Business elective	3
		17			15-19

Summer Course

SDT 4801	Summer Internship	0
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Fourth Year

<i>Fall Semester</i>			<i>Spring Semester</i>		
Core Classes			Core Classes		
BUS XXXX	Business elective	3	CHE 1031	General Chemistry I	4
BUS XXXX	Business elective	3	ELE XXXX	AH/SS elective	3
ELM 4015	ELM Power Systems	4	MAT 2021	Statistics	3
SDT 3121	SDT Studio I	3	SDT 4122	SDT Studio II	3
SDT 4802	Internship Review	1			
EET			EET		
Select one:			Optional:		
ARE 2031	Environmental Systems	3	ATT 2060	Advanced Technology Vehicles	4
ATT 2060	Advanced Technology Vehicles	4			
MEC			MEC		
ARE 2031	Environmental Systems	3	Optional:		
			ATT 2060	Advanced Technology Vehicles	4
		16-18			13-17

Technical Education Program

The Career and Technical Teacher Education Program is an approved Vermont Department of Education (DoE) 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, s/he enters 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 DoE, 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 (<i>continued</i>)	3
EDU 2061	Teaching Methods II	3
EDU 2062	Teaching Methods II (<i>continued</i>)	3
TEC 1130	Vocational Instruction for Students with Special Needs	3
PSY 2110	Educational Psychology	3
EDU 2802	Externship I	1
TEC 1110	Issues & Trends in Technical Education	3
EDU 3550	Technology in the Classroom	1
EDU 2710	Capstone	1
		24

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

Telecommunications Technology

The Associate of Applied Science degree in Telecommunications Technology program is part of a cooperative effort among Vermont Tech, the telecommunications industry, and other New England colleges. Presently, enrollment in the program is open only to employees of sponsoring organizations.

The program provides a thorough examination of state-of-the-art telecommunications technology, as well as a solid foundation in mathematics, electronics, physics, and general education subjects. The instructional approach is applications-oriented with a science and technology emphasis. Graduates of the program are proficient in the broad range of technical competencies required of highly-skilled telecommunications technicians.

The general education foundation in mathematics, computer applications, social science, and written and oral communications provides essential support for the specialized coursework in electronics and technical subjects specific to the telecommunications industry.

The normal number of credits for the degree is 61.

Fall

First Semester		Credits
CIS 1030	Introduction to Computers	3
MAT 1421	Technical Mathematics I	4
TCT 1000	Telecommunications Orientation	1

Third Semester

ELT 2030	Digital Electronics II	4
MAT 1422	Technical Mathematics II	4

Fifth Semester

ELT 1101	General Electronics	4
TCT 1001	Telecommunications I	4

Seventh Semester

ENG 2080	Technical Communication	3
TCT 2003	Telecommunications III: LANS & WANS	4

Spring

Second Semester		Credits
ELT 1110	Digital Electronics I	4
ENG 10XX	English	3

Fourth Semester

ELT 1070	Electrical Circuits	4
PHY 1041	Physics I	4

Sixth Semester

TCT 1002	Telecommunications II: Intro to Voice & Data	4
ELT 1102	General Electronics II	4

Eighth Semester

SSC XXXX	Social Science elective	3
TCT 2004	Telecommunications IV: Advanced Topics	4

**Students who do not place into ENG 1060 or 1061 may need to take remedial coursework.*

TCT 0001 – Asset Test Preparation may be a prerequisite to the first semester for some students.

Undeclared Major

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

Students who might be interested in this program who are uncertain about a major, want to begin college in mid-year, would like a lighter credit load, would like a slower pace, or have other plans for subsequent semesters should discuss this with their academic advisor.

Students who matriculate as undeclared will be expected to select a degree program by the end of their second term at Vermont Tech. When ready to declare, students will apply 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 departmental approval and is through the Admissions department for “capped” programs. Once in the program, students are expected to meet all the requirements of that program for graduation.

Enrollment as undeclared is based on placement, student desires, and class availability. Undeclared status will also increase the time it takes to complete a degree. Students are not eligible to graduate as undeclared and will not have scheduling priority over degree-seeking students.

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

Sample Semesters:

<i>Fall Semester</i>				<i>Spring Semester</i>	
XXX1000	Freshman Seminar	1	CISXXXX	Computer elective	2
CISXXXX	Computer elective	2	ENGXXXX	English	3
ENGXXXX	English	3	MATXXXX	Mathematics	2-5
MATXXXX	Mathematics	2-5	SCIXXXX	Science	3-4
SCIXXXX	Science	3-4	ELEXXXX	Elective	3
ELEXXXX	Elective	3			
		15-18			15-18

Veterinary Technology

Graduates of this program have various employment opportunities, including veterinary practices, universities, pharmaceutical/ biological research companies, diagnostic labs, feed companies, zoos, and government veterinary facilities.

The college farm gives students excellent exposure to dairy cattle and horses, and the newly-remodeled facility on the main campus provides a modern setting for experience with dogs, cats, rodents, reptiles, and birds. Basic restraint and handling is also taught on sheep, chickens, and rabbits.

All students are 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.

Students with an Associate of 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 the 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 laboratory 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 laboratory, avian, and exotic animals

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

The normal number of credits required for a degree is 69.

First Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
BIO 2320	Zoology	4	CIS 1080 Intro Spreadsheet/Db Mgmt 2
CHE 1020	Introduction to Chemistry	4	CET 1020 Animal Anatomy/Physiology 4
ENG 10XX	English	3	VET 1040 Animal Diseases 4
MAT 1210	Principles of Mathematics	3	VET 1052 Animal Care II* 1
VET 1030	Animal Care & Restraint	3	VET 1060 Laboratory Techniques 4
VET 1051	Animal Care I*	1	
		18	15
 <i>Summer Course</i>			
		VET 2801	Vet Externship 0

Second Year

<i>Fall Semester</i>		<i>Spring Semester</i>	
ELEXXXX	AH/SS elective	3	ELEXXXX AH/SS elective 3
VET 2011	Clinical Techniques I	4	ENG 2080 Technical Communication 3
VET 2030	Animal Nutrition	2	VET 2012 Clinical Techniques II 3
VET 2050	Applied Laboratory Methods	4	VET 2040 Reproduction & Genetics 3
VET 2070	Pharmacology & Toxicology	3	VET 2060 Office Procedures 3
VET 2720	Veterinary Supervisor*	1	VET 2080 Animal Behavior 2
VET 2802	Externship Review	1	VET 2090 Veterinary Technician National Exam 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.

Students who fail 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.

Course Descriptions

Key to Course Subject Abbreviations

ACC Accounting	FSC Fire Science
AER Aviation	GEO Geography
AGR Agricultural and Animal Science	GRS Graduation Standard
AHS Allied Health Science	HIS History
ARE Architectural Engineering Technology	HUM Humanities
ANT Anthropology	INT Interdisciplinary
ATT Automotive	LAH Landscape
BIO Biological Sciences	LAN Languages
BUS Business	MAT Mathematics
CED Continuing Education	MEC Mechanical Engineering
CET Civil & Environmental Engineering	MUS Music
CHE Chemistry	NUR Nursing
CIS Computer Science	PHI Philosophy
CPE Computer Engineering	PHY Physics
CPM Construction	POS Political Science
DHY Dental Hygiene	PSY Psychology
DSL Diesel	RSP Respiratory Therapy
ECO Economics	SDT Sustainable Design
EDU Education	SSC Social Science
ELT Electrical Engineering	TCT Telecommunications
ELM Electromechanical Engineering	TEC Technical Education
ENG English	THA Theatre Arts
ENV Environmental Studies	VET Veterinary
EQS Equine Studies	
ESL English for Speakers of Other Languages	

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

Accounting (ACC)

ACC 1010 Computerized Accounting (3) spring

This course demonstrates how various accounting systems are implemented and integrated on a microcomputer. Students will become proficient with applications in general ledger, receivables, payables, inventory, fixed assets, and the preparation of financial statements; 1 hour of lecture, 4 hours of laboratory per week. Prerequisite: ACC 2121 or 1020

ACC 1020 Survey of Accounting (3) fall/spring

This class is designed for non-business majors. Students will identify accounts and process and record typical cash receipts, cash payments, and payroll transactions for a service business and a merchandising business. Students will complete a worksheet and prepare and interpret financial statements. Students will prepare adjusting and closing entries and understand inventory valuation and depreciation of plant assets; 3 hours of lecture per week. Prerequisite: None

ACC 2121 Financial Accounting (4) fall

This course covers the basics of generally accepted accounting principles, terminology and accounting cycle. Students will learn to prepare financial statements and become familiar with special journals, receivables, payables, control accounts, inventory, depreciation, deferrals, accruals, and payroll; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

ACC 2122 Managerial Accounting (4) spring

This course is a continuation of Financial Accounting and covers accounting concepts of partnerships and corporations. Topics also include bonds, investments, financial statement analysis, and cash-flow analysis. Students will gain entry-level skills which permit employment in keeping accurate financial records for a small business; 4 hours of lecture per week. Prerequisite: ACC 2121

ACC 2201 Intermediate Accounting I (4) as required

This course provides an in-depth examination of accounting theory for assets, liabilities, and stockholders' equity which is essential for the understanding and analysis of financial statements. The accounting cycle is reviewed and other topics include temporary investments, receivables, inventories, and fixed and intangible assets; 4 hours of lecture per week. Prerequisite: ACC 2121

ACC 2202 Intermediate Accounting II (4) as required

This is a continuation of Intermediate Accounting I. Emphasis is placed on problem solving and topics covered include long-term investments; liabilities; matching revenue and expenses for the determination of net income; income taxes; non-operational revenue; and financial statement analysis; 4 hours of lecture per week. Prerequisite: ACC 2201

ACC 2210 Cost Accounting (4) as required

This course examines in-depth concepts used in recording, classifying, and reporting cost data. Students will understand costs as related to management in the planning and control process. Topics include budgeting, job order, and job process; 4 hours of lecture per week. Prerequisite: ACC 2122

Aviation (AER)

AER 1010 Private Pilot: Ground (3) fall

This course, commonly referred to in the industry as "Ground Training" is one of two which enables the student to gain the necessary aeronautical skill, knowledge and experience to meet the requirements of a Private Pilot Certificate with an Airplane Category rating and a Single-Engine Land class rating. The second course, titled "Private Pilot - Flight [Lab]," must be completed simultaneously with this course, no exceptions. The subject material in both courses is essentially identical, the difference being entirely comprised of where and how the student learns content; 3 hours of lecture per week. Prerequisite: Permission of department chair Corequisite: AER 1020

AER 1020 Private Pilot: Flight (Lab) (2) fall

This course, commonly referred to in the industry as "flight training", is one of two courses that enable

students 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 ratings. The second course, "Private Pilot - Ground," must be completed simultaneously with this course. The subject material in both courses is intimately integrated, with the differences in content primarily comprised of where and how the student learns the material; flight training includes the number of minimum practice hours to meet performance requirements of an FAA Private Pilot Certificate; 6 hours of laboratory per week. Prerequisite: Permission of department chair Corequisite: AER 1010 [Course fee: \$10,825]

AER 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 students with a foundation for understanding and applying weather factors to the safe operation of aircraft in preparation for FAA exams for safe Visual Flight Rule (VFR) operation and earning a Private Pilot Certificate. Meteorological sections of the FAA Private Pilot written exam is the final for this course; 3 hours of lecture per week. Prerequisite: None Corequisite: AER 1020

AER 1032 Aviation Meteorology II (3)

spring

A deep understanding of hazardous and potentially hazardous weather conditions and how it impacts aircraft operation is essential to accurately analyze, plan and safely react to changes in weather. This course builds on Meteorology I foundations with those aspects of weather that are essential for being certified by the FAA Instrument Flight Rules (IFR) operation, including: Air masses & fronts, turbulence, icing, thunderstorms, IFR approach & departure procedures, arctic & tropical weather, and soaring. During the Instrument Ground, Instrument Flight, and Meteorology courses, students will be routinely challenged to analyze hazardous meteorological conditions; Instructors and students will provide feedback on the effectiveness of interpretations; 2.5 hours of lecture, 1.5 hours of laboratory per week. Prerequisite: AER 1031 and a Private Pilot certificate *or* instructor permission Corequisite: AER 1110, 1120

AER 1110 Pilot Instrument Rating: Ground (3)

spring

This course, commonly referred to in the industry as "Instrument Flight Rating, Ground" (aka IFR-Ground) training is one of two that enable the student to gain the necessary aeronautical skill, knowledge and experience to meet the requirements of a Instrument Rating with an Airplane Category and a Single-Engine Land class rating. The second course, titled "Pilot Instrument Rating - Flight" must be completed simultaneously with this course, no exceptions. The subject material in both courses is essentially identical, the difference being entirely comprised of where and how the student learns content, as well as the number of minimum hours practicing to meet performance requirements for an FAA pilot IFR certification; 3 hours of lecture per week. Prerequisite: AER 1010 Corequisite: AER 1120

AER 1120 Pilot Instrument Rating: Flight (2)

spring

This course, commonly referred to in the industry as "Instrument or IFR Training" is one of two that enable the student to gain the necessary aeronautical skill, knowledge and experience to meet the requirements of a Instrument Rating with an Airplane Category and a Single-Engine Land class rating. The first course, titled "Pilot Instrument Rating - Ground," is commonly referred to in the industry as "IFR Ground training;" must be completed simultaneously with this course, no exceptions. The subject material in both courses is essentially identical, the difference being entirely comprised of where and how the student learns content, as well as the number of minimum hours practicing to meet FAA Pilot Certification requirements. When an Advanced Aviation Training Device (AATD) is used, the ideal sequence is to learn the module in the ground training device, followed by practice in the airplane in the flight training of the same material. The Instrument Rating is made up of 2 requirements: Aeronautical Skill and Aeronautical Knowledge; this course meets the Aeronautical Skill requirement. The ultimate goal is for the student to be able to fly solo to IFR standards, safely as well achieve an FAA IFR Pilot Certificate; 6 hours of laboratory per week. Prerequisite: valid Private Pilot or Commercial Pilot certificate with Airplane category and Single-Engine class Corequisite: AER 1110 [Course fee: \$10,835]

AER 2010 Commercial Pilot: Ground (4)

fall

This course, commonly referred to in the industry as "Commercial Pilot - Ground Training" is the first of three courses that enable the student to gain the necessary aeronautical knowledge, skill, and experi-

ence to meet the FAA requirements of a Pilot Commercial Certificate with an Airplane Category and a Single-Engine Land class rating. The second course, titled "Commercial Pilot – Flight Phase 1" must be completed simultaneously with this Ground course, no exceptions. The third course, "Commercial Pilot - Certificate – Flight Phase 2" must be completed in 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 the minimum hours required by Federal Aviation Regulations (FARs); 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: FAA Instrumentation Rating certificate Corequisite: AER 2021

AER 2031 Commercial Pilot: Flight Phase I (3)

fall

This course, commonly referred to in the industry as "Commercial Pilot Flight" training is the second of three courses 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. The first course, titled "Commercial Pilot - Certificate – Ground", must be completed simultaneously with this course, no exceptions. The third course, "Commercial Pilot - Certificate – Flight Phase 2" must be completed next semester to earn the FAA Commercial Pilot Certificate. In Phase I, the application focus is on dual flight, while Phase 2 rehearses prior knowledge while being intensively focused on training for successful and safe solo flights. 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 the minimum hours required by Federal Aviation Regulations (FARs); 9 hours of laboratory per week. Prerequisite: AER 1020, 1120; student must be 18 years old and possess a valid Private Pilot or Commercial Pilot certificate with Airplane category & Single-Engine class Corequisite: AER 2010 [Course fee: \$15,865]

AER 2032 Commercial Pilot: Flight Phase II (3)

spring

This course, commonly referred to in the industry as "Commercial Pilot Flight Training" is the third of three courses that enable the student to gain the necessary aeronautical knowledge, skill, and experience to meet the requirements of a Pilot Commercial Certificate with an Airplane Category with a Single-Engine Land and Sea class rating. This course, must be completed this semester and immediately following the first two, to earn the FAA Commercial Pilot Certificate. This course is practice intensive to build skills, with a planned 60 hours of flight time, however, the student applicant's cumulative flight time must reach the minimum 120 hours required by Federal Aviation Regulations (FARs) before taking the Checkride and being awarded the Commercial Pilot Certificate; 9 hours of laboratory per week. Prerequisite: AER 2031, pass on the Commercial Pilot Knowledge Exam (per FAA regulations) [Course fee: \$14,335]

AER 2040 21st Century Avionics/Instrumentation (3)

fall

This course provides students with a foundation for understanding and applying new and advanced instrumentation technologies, including cockpit CRT/computer screens, global positioning systems, sensors, automation, and Flight Management Systems (FMS) in the operation of aircraft. Students will learn about the transition from analog instruments ("round dial") to computerized systems – referred to broadly as the "glass cockpit". The glass cockpit increases visual stimulus and informational complexity that, enables faster decision-making, but also introduces new challenges in managing information while safely operating aircraft; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: AER 1120 or FAA Instrument Rating certificate This course will include discussion on the different capabilities and purposes of various flight simulators and the value of recurrent simulation training to maintain a pilot's operational and decision-making skills. Simulator practice sessions and labs activities are essential. Students will be expected to practice until they achieve mastery with simulator scenarios, including effective response to IFR flying and emergencies while implementing proper Crew Resource Management (CRM) procedures; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: AER 1120 or FAA Instrument Rating certificate

AER 2110 Aviation Safety & Accident Investigation (3)

spring

Safety factors permeate virtually all aspects of the aviation industry, the Aviation, Professional Pilot Technology Program, and all FAA certifications. This course provides students 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. Students will use actual NTSB accident reports to explore, analyze, and discuss the complex and interacting factors involved with air-

craft 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. Students will attend at least two FAA Team Safety Seminars during the semester; 3 hours of lecture per week. Prerequisite: Private Pilot certificate or instructor permission

AER 2130 Aviation History (3)

This class focuses on the evolution of flight technology, beginning with “pre-history” and the Wright Brothers through design innovations during and after World Wars I and II, to key technological advancements in recent years. Emphasis will be placed on the history of aerodynamics and engines, including industry drivers, design, concepts, structures, and materials. Students will be exposed to the emergence of parallel supporting technologies, such as radar, communications, and the glass cockpit. Students will investigate benchmark accident findings and present how such findings spurred fundamental design changes. The intention of the class is give students an opportunity to “see, touch and feel” flying machines so that they can understand the evolution of aviation physics and get a hands-on sense of evolving design concepts. Students should be able to describe why and how emerging technologies become incorporated into aviation in order to better assimilate future changes in aircraft engines, structures, and electronics; 3 hours of lecture per week. Prerequisite: None

AER 2610 Aviation Project I (2)

fall

This supervised learning activity provides students with an opportunity to explore a specialty in the aviation field which applies to their career interests. Students are encouraged to take advantage of current events, find an internship in an aviation-related enterprise, investigate the job market in a potential specialty of interest, or do research on emerging technology in materials, fuels, alternative designs (particularly of wings & body shapes), or software applications. Prior to project implementation, students will prepare a proposal which outlines goals, a plan of study, and a documented means to measure learning and conduct an assessment; 1 hour of lecture, 1.5 hours of laboratory per week. Prerequisite: ENG 1060

AER 3010 Certified Flight Instructor: Ground (3)

fall

This intensive course focuses on building skills necessary to pass the FAA Certified Flight Instructor’s knowledge exam and prepare for the CFI-Airplane course. The course will build on the students extensive knowledge of technical aspects of being a professional aviator by adding knowledge and skills of an expert trainer. All weekly sessions will start by introducing concepts, techniques, procedural training methods, and science behind instructional technology and adult learning, but will end with applied activities for practicing new methods to observe how learning works. Expert coaching with peer observation and critique will create an environment where performance feedback, both formative and summative, is both a routine and highly valued experience. Students should come away knowing that improving one’s instructional skills is a challenging, lifelong endeavor that always needs improvement, but along with that they will also be skilled at the methods needed to continuously build on the art of instruction; 3 hours of lecture per week. Prerequisite: FAA Commercial Pilot certificate

AER 3020 Certified Flight Instructor: Airplane (3)

spring

This is a capstone course for any pilot that results in a Certified Flight Instructor (CFI) certificate issued by the FAA, and positions the student for hiring into their first job with the flight-school in their senior year or as a future flight instructor. This course closely continues with the training in the Instructor Training: CFI-Ground This hands-on course puts the student applicant into a tutoring environment with an FAA Certified Flight Instructor on all flights or simulation activities. Students will have routine opportunities for riding as observers and participating in pre & post flight briefings. Such participation acclimates everyone to objective personal performance critiques in addition to honing observational skills. By the time students begin CFI-Airplane training, they will have been certified up to a level that makes them proficient with technical content and skills. This course focuses on the learning and practice needed to teach others to fly; 9 hours of laboratory per week. Prerequisite: FAA Pilot, Instrument, & Commercial Pilot certificates; AER 3010 [Course fee: \$6,110]

AER 3030 Human Factors, Risk Management/Crew Resource Management (3)

fall

Students will learn and apply concepts and principles related to the most critical resource in aviation: people. A successful pilot has a capacity to analyze situations, make decisions, and perform well individually and in teams under both routine and crisis conditions while flying complex automated aircraft.

In this course, students will learn how to assess situations, risk factors, and the capabilities of all available resources in order to execute a plan of action during each phase of flight under a variety of operational and environmental conditions. The course covers crew resource management (CRM) and human factors essential to flight operations and dangers inherent with crews not trained to perform delegated responsibilities or to challenge inappropriate actions. The course structure will build toward implementing Line Oriented Flight Training (LOFT) using real life scenarios. Students must attain an FAA CRM certification to get credit for this course; 3 hours of lecture per week. Prerequisite: Commercial Pilot certificate, Instrument Rating

AER 3040 Aircraft Maintenance for Pilots (3)

spring

Students get an in-depth, hands-on understanding of the mechanics of aircraft systems and relevant components in order to be very familiar with how they operate, their operating limits, thresholds, and capabilities. Through hands-on practice in a shop setting, they will become familiar with the tools for performing various pilot maintenance tasks that the FAA permits for pilot-owned aircraft. The class covers the specific Flight Aviation Regulations (FARs) which govern pilot maintenance, and students will keep an up-to-date logbook to maintain legal entries and pass an FAA audit. Student will explore maintenance-symptom recognition for these systems, as well as when, where, and how to repair and write up their maintenance logs. This in-depth knowledge will help the students become better pilots and it will enable them to communicate effectively with mechanics as they manage the maintenance and repair of the aircraft for which they are responsible; 1 hour of lecture, 6 hours of lab per week. Prerequisite: Private Pilot certificate

AER 4010 Multi-Engine Ground/Flight (1)

fall

A multi-engine certificate gives a competitive advantage with seeking employment within a commercial aviation sector. From the fundamentals of flying multi-engine aircraft and the aerodynamic laws that govern multi-engine flight up to the challenging task of learning the related aeronautical knowledge students will become a proficient and knowledgeable multi-engine pilot. The instruction takes students up to the skill levels necessary to earn a multi-engine rating certificate and checking out in a new twin. Students will have an opportunity to practice taking the written exam used when checking out in a new twin, and will have access to reprints of applicable FAA advisory circulars and source material for further study on all aspects of multi-engine training. This course is all hands-on flight time tutoring with expert flight instructors and observing peers in the cockpit or on a simulator. Students will practice to proficiency and master the content; 3 hours of laboratory per week. Prerequisite: AER 3020 Corequisite: AER 4020 [Course fee: \$6,620]

AER 4020 Certified Flight Instructor: Instrument Ground/Flight (1)

fall

In this course, students will apply their pilot skills gathered throughout the program and learn how to instruct a private pilot through the requirements necessary for them to achieve a Pilot Instrument Rating. The course assumes the student is already a skilled pilot, so the emphasis is on honing their instructional skills learned during their CFI-Ground and CFI-Airplane courses, and demonstrated with their certifications. At the end of the course, students will be able to achieve their CFI-Instrument Flight Certificate; and, along with the CFI-Multi-Engine certificate, they will have achieved their 8th and 9th certificates from the program. This is therefore one of two capstone skill achievements and the final certifications that give them an important advantage towards landing a commercial job as a pilot; 3 hours of laboratory per week. Prerequisite: AER 3020 [Course fee: \$1,585]

AER 4030 Certified Flight Instructor: Multi-Engine Ground/Flight (1)

fall

Students apply their pilot skills gathered throughout the program and learn how to instruct a private pilot through the requirements necessary to train pilots up to a Multi-Engine Rating for both Land & Sea. The course assumes the student is already a skilled pilot, so the emphasis is on honing their instructional skills learned during all of their pilot courses, and demonstrated with their certifications. In particular, they will learn how to train pilots through to achieving a Multi-Engine rating. At the end of the course, students will be able to achieve their CFI- Multi-Engine Land & Sea certificate from the Aviation program. This is therefore one of two capstone skill achievements and the final certifications that give them an important advantage towards landing a commercial job as a pilot. This course is entirely flight training (labs), and follows, with some overlap, training for the Multi-Engine Ground/Flight certifications; 3 hours of lecture per week. Prerequisite: AER 3020 Corequisite: AER 4010 [Course fee: \$3,775]

AER 4040 Corporate Flying & the Aviation Business (3)

fall

Students will get a broad perspective on the aviation business, commercial and corporate flying (including equipment choices and operations), support services and airports. The focus is on the politics, culture, and operational differences in aviation businesses, such as small charters, corporate fleets, freight, international carriers and airports. Students study the impact of global competition, operational costs, and slim margins on both career stability and safety. Students get a perspective on the opportunities and methods for pursuing a career within the array of options available. Students will experience the steps needed to apply for jobs, network, customize resumes, and complete job applications. The instructor provides ongoing guidance on the job-application processes and job survival methods for an unpredictably cyclical business. Students discover the kinds of ethical dilemmas they may face in their careers 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 program standing or instructor permission

AER 4050 Advanced Aerodynamics & Flight Controls (3)

fall

Students complete an in-depth study of the aerodynamics of flight, flight systems, and aircraft design in this course. By understanding design, students will better understand the forces acting on an airplane, how the characteristics of different systems affect performance in each phase of flight. Students discover how the aerodynamic characteristics of a given design, including the physical limits of each system, always play an integral part in a pilot's decision-making process. Anything that flies has design compromises; a student needs to understand the "whys" underlying design compromises in order to learn new technology. Students also study the historical evolution of aerodynamics and systems as they apply to greater stability and controllability of aircraft to better understand the interacting technical issues and trade-offs made in a design. Students gain insight on the rapidly accelerating pace of change, including advanced wing design, computerized engine and flight control systems, as well as the FAA requirements and standards for systems; 3 hours of lecture per week. Prerequisite: Senior standing or instructor permission

AER 4110 Advanced Transport Category Systems (3)

spring

A prospective airline pilot will go through extensive screening in the employment process that proves their potential to command an aircraft and demonstrate maturity and adaptability across three challenging dimensions: a) weather & meteorological phenomena, b) navigating and operating an aircraft smoothly and safely, c) complex systems and operational limits of each aircraft they operate. The student's senior year is designed to prepare for these challenges, this course specifically deals with the technology of flight found in modern advanced commercial airline aircraft and related operational principles that must factor into risk assessment, crew resource management and decision-making; 3 hours of lecture per week. Prerequisite: None

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 to the highways, or tracks, in the sky. This course prepares students to apply for international operation First Officer positions. Toward this end, students will explore standard airline operations in the North Atlantic (NAT) and Pacific Track systems, including flight planning, oceanic control sectors, clearance communications, plotting, track entry/exit, and required position or event reports. Students will learn how to use plotting charts and Atlantic and Pacific Navigation charts, how to respond to changes in the tracks due to weather, and techniques to react to weather changes within a track within operational rules. Students will also learn the special requirements governing communications, operations, and reporting related to emergency and diversion procedures in the NAT system. They will practice by flying in simulators with scenarios that deploy international flight operation rules under normal and emergency conditions; 3 hours of lecture per week. Prerequisite: AER 3020, 4050 Corequisite: AER 4130

AER 4610 Aviation Senior Project (3)

spring

In this capstone experience, students apply what they have learned in the Professional Pilot Program to a project selected, proposed, planned, implemented, and presented by specific project team(s). Under the guidance and supervision of skilled faculty and community experts, the students will augment their experience with new learning in group-based project-management skills, including planning, teamwork, problem solving, leadership, and time management. Each student will have the opportunity to assume different roles and responsibilities on the project, and they will be graded by participating in a rigorous

evaluation process that includes criterion referenced peer reviews and a project performance assessment; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: Senior program standing or instructor permission

Agriculture and Animal Science (AGR)

AGR 1011 Agricultural Techniques I (2) fall

This course is designed to facilitate 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 laboratory, students will be exposed to the practical skills necessary to succeed within the agricultural curriculum under the supervision of experienced farm staff. Students will be introduced to student rights & responsibilities, will learn how to interact with faculty and classmates, will explore agricultural careers, will learn good time management, and will learn how to enhance academic performance; 1 hour of lecture, 2 hours of laboratory per week, plus two weeks of farm work experience. Prerequisite: None

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. Students work closely with the farm staff to complete their selected topics during the semester; 2 hours of laboratory per week, plus one week of required farm work experience. Prerequisite: None

AGR 1030 Animal Reproduction and Genetics (3) spring

Students are expected to develop 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. Students are expected to develop sound breeding and selection systems; 3 hours of lecture per week. Prerequisite: None

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. Prerequisite: None

AGR 1061 Burls to Boards (3) fall

Students will understand the principles of tree harvesting for wood product production. The choosing, cutting, skidding, and milling of common types of lumber in Vermont will be discussed and practiced. Successful students will be able to manage small woodlots for efficient personal production of lumber products upon completion; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: AGR 1011 or instructor permission

AGR 2011 Dairy Herd Management I (3) fall

This course concentrates on the profitable care and management of a dairy herd. Detailed practices that are essential to operating a modern, efficient dairy herd are presented in lecture. These principles are reinforced in laboratory experiences that utilize the college herd. Various field trips are planned to complement what is taught in lecture and laboratory. Active student participation is expected. Dairy Herd Management I deals with record keeping and the development and implementation of breeding and feeding programs that will accomplish a desired set of goals. Students also learn how to manage the reproductive performance of the herd as well as how to raise quality herd replacements. Further covered is the production of quality milk and the ability to identify weaknesses in a dairy operation; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: AGR 1030, 2030 or instructor permission

AGR 2012 Dairy Herd Management II (3) spring

A continuation of Dairy Herd Management I with emphasis on execution of the objectives identified in AGR 2011 and BUS 2260 as it pertains to business on a dairy farm; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: AGR 2012 or instructor permission

AGR 2020 Farm Buildings (2) fall

Farmstead planning and basic structural concepts for farm buildings are emphasized. Subtopics include construction materials and methods, environmental issues, waste management, feeding systems, and housing systems. 2 hours of lecture per week. Prerequisite: None

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. Students will be asked to develop 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 and/or the student's home farm; 3 hours of lecture, 2 hours of laboratory per week for the first half of the term. Prerequisite: None

AGR 2040 Forage Production (3) fall

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 laboratory per week for the first half of the semester. Prerequisite: None

AGR 2050 Large Animal Diseases (3) 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 students' 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. Prerequisite: None

AGR 2060 Beef Production (2) spring

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 will also be discussed; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: None

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 will also be presented; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: None

AGR 2720 Issues and Trends in Agriculture (2) fall

This course emphasizes new ideas in agriculture and some of the primary issues impacting animal agriculture. Students investigate new and/or alternative production methods with emphasis on sustainable agriculture and work to ably represent agricultural strategies both in oral and written forms. Field trips and guest speakers provide students with the opportunity to evaluate societal concerns about various aspects of modern production agriculture; 2 hours of lecture per week. Prerequisite: Sophomore standing

AGR 3020 Advanced Livestock Production (3) spring

In this course, students learn the reproduction, nutrition, house, and financial requirements of profitable Vermont livestock operations. Swine, poultry, and small ruminant dairy will be covered in detail. Emerging livestock production including camelids, meat goats, ostriches, and emus will be covered; 3 hours of lecture per week. Prerequisite: AGR 1030, 1050, and 2030

AGR 3030 Advanced Dairy Cattle Nutrition (3) spring

Students in this course will analyze and develop rations for dairy cattle. Students will be able to troubleshoot existing rations and make recommendations for improvement of dairy rations. This course will be lab-intensive; 1 hour of lecture, 4 hours of laboratory per week. Prerequisite: AGR 2030

AGR 3040 Maple Production: Science and Practice (3)**spring**

Current information relating to all aspects of maple production will be 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 will be covered; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: LAH 1050 and BIO 1220

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. Successful students will be able to interpret soil tests and make recommendations for soil amendments that benefit the farmer and the environment; 3 hours of lecture per week. Prerequisite: LAH 1050 or CET 2110 and SDT 3130

AGR 3110 Apples, Berries, and Bees (3)**fall**

The production requirements of apples, common berries, and honey bees will be discussed in this course. Plant or species selection, growing requirements, disease prevention, and harvesting will be discussed for each. Successful students will feel confident managing production of each of these agricultural products; 3 hours of lecture per week. Prerequisite: AGR 3050, BIO 1220, or instructor permission

AGR 3111 Vegetable and Fruit Production (3)**spring**

Students will learn the basic principles of planning, managing, and marketing for vegetable crop production. The focus will be on techniques used in commercial production and emphasis will be placed on learning the different plant families and how to grow the major crops. Basic methods for dealing with pest and disease management will be discussed and major pests and diseases affecting the northeast will be identified. Post-harvest issues will also be covered such as storage, handling, and different marketing options; 3 hours of lecture per week. Prerequisite: BIO 1220 or LAH 1050

Allied Health Science (AHS)**AHS 2011 Emergency Medical Service (6)****fall**

This course combines classroom and laboratory instruction in all phases of pre-hospital emergency care at the emergency medical technician level. Clinical practice includes patient assessments, required participation in ambulance/rescue emergency service response, and hospital experience. This course prepares students for EMT-B and CPR/AED certification through a written exam, hospital care, and proficiency skill testing. In addition, after successful completion of this course, students will be eligible to take the NREMT EMT-B certifying exam; 4 hours of lecture, 2 hours of laboratory per week. Prerequisite: None [Course fee: \$200] Non-credit version of AHS 2011 is CED 0011

AHS 2035 First Aid and CPR (2)**spring**

This course is an introduction to 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. Students will be able to provide first responder stabilization, treatment, and CPR; 4 hours of studio per week. Prerequisite: None [Course fee: \$75]

Architectural Engineering (ARE)**ARE 1000 Freshmen Seminar (1)****fall**

This course provides a forum for first-year students to learn about the program and about the architectural and engineering professions and the building construction industry. Skills that will assist the student in having a successful experience at the college are also discussed; 1 hour of seminar per week; graded Pass/No Pass. Prerequisite: None

ARE 1010 Architectural Woodframe Construction (3)**fall**

This course covers basic instruction in architectural construction graphics and the use of hand drawing equipment, as well as an introduction to the materials of light woodframe construction. A set of drawings for a small residence is developed; 6 hours of studio per week. Prerequisite: None [Course fee: \$20]

ARE 1021 Architectural CAD I (2)

fall

This course covers basic instruction in computer-aided drafting and design as related to architectural and building engineering technology. The students will receive instruction using AutoCAD; 3 hours of studio per week. Prerequisite: Concurrent enrollment in ARE 1010 and CIS 1050 or instructor permission [Course fee: \$35]

ARE 1210 Construction Materials and Methods (6)

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 laboratory sessions familiarize students 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; 4 hours of lecture, 3 hours of materials testing laboratory, and 3 hours of detailing studio per week. Prerequisite: ARE 1010 and 1021 [Course fee: \$30]

ARE 1220 Architectural History (3)

spring

Through photo slide lectures, 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 through the present day. A major concentration is development since the 18th century, particularly in America, and its significance to today's society. Lecture discussions develop visual perception and knowledge of aesthetic principles from a view of architectural history; 3 hours of lecture per week. Prerequisite: None

ARE 2022 Architectural CAD II (3)

fall/spring

This course covers advanced instruction in computer-aided drafting and design for architectural and building engineering. There will be combined lecture and studio sessions in the use of "Building Information Modelling" in Revit to develop student skills in the industry standard for 3D design. Building design as well as presentation drawings and renderings will be explored; 6 hours of studio per week. Prerequisite: ARE 1021 and 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. Prerequisite: ARE 1021, ELT 1052, or MEC 1011 Corquisite: PHY 1043 [Course fee: \$10]

ARE 2032 Environmental Systems II (3)

spring

This is a continuation of Environmental Systems I. 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 and MAT 1420 [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 residential to small public buildings. 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 1010, 1210, and 1220 and concurrent enrollment in ARE 2031 or CPM 1021, 1022, 1031, 1032, 1111 and CET 1031 [Course fee: \$20]

ARE 2052 Architectural Design II (3)**spring**

This course is a continuation of Design I. The design projects and problem solving involve more complex buildings than the previous course. The final project is a “real world” building in Vermont. Students learn to work with things such as zoning, building codes, and users of the building. Throughout the course, oral and graphic communication and presentation skills are developed as appropriate. Students work in teams 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 sophomore students 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)**spring**

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 curriculum by introducing students 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 (may be concurrent with permission), 2051, and CET 2120 or CPM 2030 or by AE.CET to BS.AET transfer policy (ARE 1210, 2031, and 2032 and PHY 1043 [may be concurrent with permission]) [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 most students obtain in a course on statics. Topics include static determinacy and stability, reactions, 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: MAT 1520 and CET 2040

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, and CET 2120

ARE 3040 Electrical/Lighting Systems (3)**spring**

This course familiarizes students 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, or SDT 3110 and ELT 3020 or SDT 4110

ARE 3050 Fundamentals of Fluids and Thermodynamics (4)**spring**

Students study 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 laboratory per week. Prerequisite: MAT 1520 and PHY 1042 or 1043

ARE 3111 Codes and Loads: Structural (1)

fall

This course provides students with an understanding of which codes and specifications govern the determination of design structural loads for buildings and other structures. It introduces students to the determination of applicable code provisions, the application of those 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 and structures design, concrete structures design, and senior project. Lectures introduce topics and methods of application; the studio emphasizes the application of codes and methods on varying structure types; 1 hour of lecture, 3 hours of studio per week. Prerequisite: CET 2120, and MAT 1520 or instructor permission (Note: this is a half-semester course usually conducted the first half of the semester.)

ARE 3112 Codes and Loads: Mechanical/Electrical (1)

fall

This course provides students 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 students to the determination of applicable code provisions, the application of those 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; the studio emphasizes the application of codes and methods on varying structure types; 1 hour of lecture, 3 hours of studio per week. Prerequisite: ARE 2032 and MAT 1520 or instructor permission (Note: this is a half-semester course usually conducted the second half of the semester.)

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: CET 2120, ARE 3110, and 3020

ARE 4020 Architectural Engineering Management (3)

fall

This course covers many of the business, management, professional, and ethical subjects that architectural and other engineers 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 students develop communication skills and the ability to analyze and create management-related documents using various methods; 3 hours of lecture per week. Prerequisite: ARE 2040

ARE 4030 HVAC Systems (4)

fall

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. Students are required to perform system design on a commercial building in preparation for Senior Project. 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, and 3110 or SDT 3110 [Course fee: \$5]

ARE 4040 Plumbing Systems (3)**spring**

Students in this course learn 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; 6 hours of studio per week. Prerequisite: ARE 2032 and 3050

ARE 4050 FE Exam Survey (1)**spring**

This course provides students and practicing professionals with applications for, and review of, engineering, math, and science concepts to prepare for the Fundamentals of Engineering (FE) examination administered by most states as a first step toward professional licensure as a Professional Engineer. The course focuses on topics that students have been exposed to previously and on 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 and similar examinations are covered, as is the application of engineering judgment in general; 3 hours of lecture/ laboratory per week. Prerequisite: Senior standing in AET or an ABET-accredited program or instructor permission

ARE 4720 Senior Project (4)**spring**

This course is a capstone course that integrates knowledge and skills developed through other coursework and life experience. Students typically prepare drawings, design documentation, and presentations for a commercial project based on preliminary and incomplete architectural plans (the ASHRAE national student competition building is often used) or other information. Students work on electrical/lighting, mechanical, or structural systems. In most cases, a semester-long final design in one subject area is done; 2 hours of lecture, 6 hours of studio per week. Prerequisite: ARE 2022, 3030, 3040, 3111, 3112, 4010, 4020, and 4030 [Course fee: \$10]

Anthropology (ANT)**ANT 1010 Introduction to Cultural Anthropology (3)****as required**

This course is a survey of basic issues, concepts, theories, and methods of cultural anthropology. Students think critically about the evolution of culture and society from the perspective of the past and the present. Topics include social and political organization, gender, myth, religion, language, cultural ecology, and cultural exchange; 3 hours of lecture per week. In fall 2011, it will be offered online only. (General Education: SS) Prerequisite: None

Automotive (ATT)**ATT 1010 Suspension and Steering (3)****fall**

This course is designed to give 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; the physics of hydraulics; vehicle suspension requirements; vehicle handling and dynamics; and the diagnosis of suspension problems. This course also includes curriculum necessary for successful completion of the Vermont state inspection certification test, administered by the DMV. Students who are already certified will receive credit for the inspection portion of the course; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

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 mathematical solution of performance characteristics is demonstrated. Alternative engines and fuels are also discussed. The laboratory reinforces the lecture by providing engine performance diagnostic procedures and mechanical repair and overhaul procedures. System problem diagnosis and component failure analysis are continually stressed; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

ATT 1040 Automotive Electrical Systems (4) spring

This course is intended to give the student a thorough understanding of automotive electrical systems and to teach diagnostic and troubleshooting skills. Topics include the operation and testing of storage batteries, starting systems, charging systems, and basic accessory systems. The student will become familiar with various types of test equipment, diagnostic charts, and vehicle wiring schematics; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ATT 1120 [Course fee: \$50]

ATT 1050 Alignment and Brakes (4) spring

This course is designed to give 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; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ATT 1010

ATT 1120 General Electronics for Automotive (4) fall

This course will introduce the student to general electrical and electronic principles, theory, and components. Topics include Ohm's Law, circuit analysis, basic circuits, diodes, transistors, relays, and solenoids. The laboratory will use electrical test equipment to analyze and troubleshoot basic electrical circuits including warning systems and electrical accessories; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None [Course fee: \$110]

ATT 2010 Engine Performance (4) fall

This course gives the student an understanding of fuel delivery and other systems as they relate to the internal combustion engine. Topics include engine air/fuel requirements; gasoline fuel injection systems; ignition systems; fuel and air delivery intake systems; exhaust systems; and sensors and diagnostics. The analysis of fuel-related problems, diagnosis of component failures, and verification of repairs are included; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ATT 1040, PHY 1030

ATT 2020 Body Electronic Systems (4) fall

This course is designed to give the student an understanding of commonly used chassis systems. Major topics studied include heating, ventilation, and air conditioning; instrument panels; air bags; and anti-lock brakes. The student is familiarized with system operation, diagnostic techniques, system failure analysis, and repair. The laboratory offers experience in diagnosis and repair of these systems as well as more practice in using electrical diagnostic techniques. This course includes the MACS AIC certification test; 3 hour of lecture, 3 hours of laboratory per week. Prerequisite: ATT 1010, 1040, and PHY 1030 [Course fee: \$110]

ATT 2030 Advanced Engine Performance and 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 to be 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; 4 hours of lecture, 3 hours of laboratory per week. Prerequisite: ATT 2010 [Course fee: \$50]

ATT 2040 Automotive Drive Trains (4) spring

In this course, students learn the principles of construction, design, and operation of mechanical devices used in the modern automotive drive train. Specific topics to be addressed include helical and planetary gear drive systems; torque converters; hydraulic control systems; principles of electronically-controlled transmissions; clutches; manual transmissions 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 laboratory per week. Prerequisite: None

ATT 2060 Advanced Technology Vehicle (4) spring

This course will introduce students to the design, operation, and servicing of electric, hybrid, alternative fuel, and fuel cell vehicles. Topics will include basic physics and chemistry influencing design; motor and

generator design and utilization; hybrid electric vehicle design variations; maintenance and service; and a basic introduction to fuel cell vehicles; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ATT 1020

ATT 2801/2802 Summer Internship/Internship Review (0/1) summer/fall

This course is a ten-week, 400-hour summer cooperative education experience followed by a one credit fall internship review; graded Pass/No Pass. Prerequisite: Departmental permission [Course fee: \$250]

Biological Sciences (BIO)

BIO 1020 Introduction to Environmental Biology (4) fall

This course is intended to introduce students to the fundamentals of environmental biology. It is an introduction to the structure and biota of several aquatic and terrestrial ecosystems and students investigate 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; critical observation; and interpretation of landscapes. The course will stress communication skills, as well as critical thinking and teamwork; 3 hours of lecture and 2 hours of laboratory per week. Prerequisite: None

BIO 1030 Nutrition (3) fall

The course focus is to provide sound, relevant background knowledge in the science of human nutrition and to translate the scientific principles of nutrition into applicable concepts of care. The course offers opportunities for the student to identify dietary modifications relating to the developmental stage of the patient. It implements the philosophy and objectives of the nursing and allied health programs by identifying the role of adequate nutrition in maintaining the health of the individual throughout the life-span; 3 hours of lecture per week. Prerequisite: None

BIO 1220 Botany (4) spring

This course provides students with an understanding of the fundamentals of plant growth and development. Higher plant structure, metabolism, growth regulators, and mineral nutrition are emphasized. Students also become acquainted with the diversity of plants and plant-like organisms through study of bacteria, viruses, algae, fungi, mosses, and lower vascular plants; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

BIO 1330 Introduction to Occupational Physiology & Psychology (3) spring

In order to safely operate vehicles or equipment, or to perform in occupations which routinely places physical or mental stress demands on a person, a professional needs to develop an awareness of not only the physiological aspects of the job, but also those that influence workload and fatigue, decision making, and situational awareness. In this course, students will study how the mind and body interact with work-place operations and how to deal with situational or operational risk factors. This course is particularly critical for the health and safety of people who are in or learning about occupations that require them to engage with machines, vehicles, or potentially dangerous operations. A key focal point of the course is on responsible self-assessment of one's readiness and ability to safely engage in occupational activities in This course is just the beginning of what should be a life-long focus area in their profession; 3 hours of lecture per week. Prerequisite: Matriculation or experience in a specific field of study or instructor permission Corequisite: Enrollment in applied field of study

BIO 2011 Human Anatomy & Physiology I (4) fall

This course is an introduction to the structure and function of the human body. It emphasizes the properties of cells, tissues, and organ systems and their relationships in health and disease. Topics include general body organization and function; cellular physiology and histology; and the anatomy and physiology of each organ system. Laboratory work parallels lecture topics and includes microscopy, study of human anatomical models, dissection of appropriate laboratory specimens, and physiologic experimentation; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

BIO 2012 Human Anatomy & Physiology II (4) spring/winter

A continuation of BIO 2011, this portion of the course includes the study of the structure and function of the endocrine system, circulatory system, immune system, respiratory system, digestive system, excretory system, and reproductive system. Other topics covered include acid/base balance and electrolyte

balance. Laboratory work parallels lecture topics and includes microscopy, dissection of appropriate laboratory specimens, and study of human anatomical models; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: BIO 2011

BIO 2030 Plant Pathology (3) spring

Students explore 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. Students learn to recognize disease symptoms. All methods of management are covered, but more emphasis is placed on preventative techniques; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: BIO 2040 or instructor permission

BIO 2040 Entomology & Ecological Pest Management (3) fall

Entomology examines the biology and management of insect and other related invertebrate pests that attack ornamental plants. Students study insect morphology, anatomy, life processes, and ecology. Special emphasis is placed on insect identification and life histories. Students explore management strategies as part of an integrated approach to pest management; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: Sophomore standing or instructor permission

BIO 2120 Elements of Microbiology (4) fall/spring/summer

This course offers the student an opportunity to examine organisms that are too small to be seen with the naked eye. This is 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. Virtual laboratory study and in-laboratory demonstrations complement the lecture. Successful completion of the laboratory exercises is a partial requirement for the course; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: BIO 2012 recommended

BIO 2320 Zoology (4) fall

A laboratory course designed to acquaint 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 highly desirable; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

Business (BUS)

BUS 1010 Introduction to Business (3) fall

The focus of this course is to survey the interconnected disciplines of economics, management, marketing, finance, operations, and information technology. The course will also facilitate college success strategies such as note-taking, time management, test-taking, and study skills. Students will be introduced to assignments typical of higher level business courses with the goal to develop effective oral and written communication, critical thinking, problem solving, interpersonal skills, and personal and professional ethical behavior; 3 hours of lecture per week. Prerequisite: None

BUS 1051 Information Processing I (3) fall

Students will develop intermediate-level skills in keyboarding, file management, Moodle, and Microsoft Word and PowerPoint. Students will plan, prepare, edit, and perfect business letters, memos, charts/tables, reports, and announcements using Word. Students will plan, prepare, and design visuals using PowerPoint; 1 hour of lecture, 4 hours of laboratory per week. Prerequisite: None

BUS 1052 Information Processing II (3) spring

Students will create professional level documents using Microsoft's Word, PowerPoint, and Publisher. Students will become familiar with Web 2.0 technologies and use Web 2.0 tools for communication and collaboration; 1 hour of lecture, 4 hours of laboratory per week. Prerequisite: BUS 1051 or equivalent skills

BUS 2020 Principles of Management (3) fall

This course is an introduction to philosophy, principles, and techniques of management. Students will examine 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 in-

clude case studies, team experiences, and simulations; 3 hours of lecture per week. Prerequisite: None

BUS 2131 Business Communication Technology (3) fall

This course will focus on writing business communication typical to today's professional workplace. Students will plan, write, and design letters, memos, e-mail messages, and instant messages. Students will use Web 2.0 technology and tools for communication and collaboration and will review research methods and citations. Students will learn job search skills which include researching the job market, writing a resume/cover letter, and preparing for job interviews; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

BUS 2132 Management Applications (3) spring

This course will focus on leadership theories and techniques applied with emphasis on the action skills that managers need for success. Course topics include accounting; leadership styles and strategies; meeting management; and parliamentary procedure. Students will describe the components of an effective business meeting and be able to conduct and participate in a meeting according to the Robert's Rules of Order; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

BUS 2140 Personal Finance (3) as required

This course is a study of the tools used in personal financial planning. The student is introduced to the process used by professional planners and shown how this can be helpful in planning their own financial futures; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

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 students with the knowledge necessary to make informed business decisions. Students will examine 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. Prerequisite: None

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 a study of the marketing mix of product, place, pricing, and promotion. Students will learn marketing strategies well suited to small business operation; 3 hours of lecture per week. Prerequisite: None

BUS 2260 Principles of Financial Management (3) fall

This course is designed to build on the knowledge from basic accounting. Students apply tools learned in this course to develop a conceptual and analytical understanding of financial management. The emphasis is on learning decision-making techniques. 3 hours of lecture per week. Prerequisite: ACC 1020 or 2121

BUS 2270 Organizational Communications (4) fall

This class offers a hands-on approach to learning the role, the process, and the skills of interpersonal, group, and public communications in professional and organizational settings. The distinctive feature and objective of the course is to understand the role of people in the organizational communication process, both individually and in work groups. Students will learn the psychology of face-to-face communication, the role of non-verbal communication, teamwork, effective listening, and professional behavior. Students will plan, prepare, and present an individual oral presentation and a team oral presentation and will attend a formal business dinner; 4 hours of lecture per week. Prerequisite: None [Course fee: \$50]

BUS 2410 Human Resource Management (3) spring

This course emphasizes selecting, training, and evaluating personnel; wages, benefits, and bargaining units; motivation, morale, and human relations; and personnel problems in the workplace; 3 hours of lecture per week. Prerequisite: None

BUS 2440 Introduction to Business Law (3) fall/spring

This course is designed to familiarize students with the law as it relates to business. Following the Uniform Commercial Code, such topics as contracts, negotiable instruments, agency bailment, real property, and insurance are covered; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

BUS 2720 Business Seminar (3)

spring

This is a capstone course for associate degree students. It integrates skills and knowledge developed through coursework and research. Students will work in teams to select a topic for an oral presentation. Students will research the topic extensively and prepare several written assignments. A final team oral presentation will be judged by college staff members and business professionals; 3 hours of lecture per week. Prerequisite: Sophomore standing

BUS 3150 Production & Operations Management (3)

fall

This course provides students with overview of the concepts, methodologies, and applications of production and operations management as an evolving discipline, with roots in industrial engineering, behavioral theories of management, quantitative methods, and other functional areas of business; 3 hours of lecture per week. Prerequisite: MAT 2021 and junior standing or instructor permission

BUS 3250 Organizational Behavior and Management (3)

spring

This course provides an understanding of 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 and Portfolio Management (3)

as required

This course examines investment in stocks, bonds, governments, warrants, options, and collectibles. Topics include investment setting; securities valuation and analysis; security markets and regulations; and portfolio constraints; 3 hours of lecture per week. (General Education: SS except for Business majors) Prerequisite: BUS 2260 and ACC 1020 or 2121

BUS 3410 Business Ethics (3)

fall

This course is designed to introduce students to the general field of ethics and to apply ethical thinking to the business environment. An overview of modern ethical thought is provided with specific cases and scenarios presented which students assess from legal, moral, and economic perspectives; 3 hours of lecture per week. Prerequisite: ENG 1061 or equivalent

BUS 4310 Business Information Architecture (3)

fall

Students will learn and apply theory, process, design, and development to create effective, user-centered oral, written, and electronic communications. The course will focus on the convergence of communication; Web 2.0 technology and tools; and the impact on business applications such as letters, memos, e-mail messages, instant messages, podcasts, social media, and oral presentations. Students will review research methods and citations; 3 hours of lecture per week. Prerequisite: Senior standing or instructor permission

BUS 4510 Business Management Through IT (3)

as required

Students examine 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 is designed to introduce students to the field of project management. Because of the wide nature of the topic and the limited time of the course, coverage will be broad. This course emphasizes and follows the Project Management Institute (PMI) model of project management; 3 hours of lecture per week. Prerequisite: Junior standing or instructor permission

BUS 4730 Senior Project (3)

spring

This is a capstone course that integrates knowledge and skills developed through other coursework and life experience. The course will focus on special topics in business and a specific business issue or problem. Students will work in cross-functional teams to select a project which involves solving a common busi-

ness problem. Students will research the topic extensively and prepare a team oral presentation of their solution. Presentations will be judged by business and industry professionals. Students will also prepare written documentation as part of their project; 3 hours of lecture per week. Prerequisite: Senior standing

Continuing Education (CED)

CED 0011 Emergency Medical Services (0) fall

This non-credit course combines classroom and hands-on instruction in all phases of pre-hospital emergency care. A minimum of six patient assessments through ride-along experience is required. This course prepares students to become EMT-B and CPR/AED Certified and to be eligible to take the NREMT EMT-B certifying exam. Graded Pass/No Pass. Prerequisite: FSC 1022 or CPR and AED certification [Course fee: \$450]

CED 0012 Firefighting Services I (0) fall

This noncredit 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 a local government; laws and regulations affecting the fire service; introduction to fire protection systems; introduction to fire strategy and tactics. Students will learn basic fire suppression, rescue, and extrication skills. After training, students will participate in a live fire exercise at a Vermont Fire Academy site. This course prepares students to become NFPA FF I & II and to be eligible to take the NFPA FF1 certifying exam; 3 hours of lecture per week. Prerequisite: None

CED 0013 Firefighting Services II (0) spring

This is a continuation of CED 0012. After training, students will participate in a live fire exercise at the Vermont Fire Academy. This course prepares students to become NFPA FF1 and to be eligible to take the NFPA FF I & II certifying exam; 3 hours of lecture per week. Prerequisite: None

Civil & Environmental Engineering Technology (CET)

CET 1000 Freshman Orientation (1) fall

This course will focus on the skills required by students for success in the CET program. The course may have guest speakers and field trips to construction projects and public facilities that will give the student a picture of the variety of work done by civil engineers and the job opportunities in the field; 1 hour of seminar per week. Prerequisite: None

CET 1011 Surveying I (3) fall

The course introduces fundamental surveying principles and methods, including the measuring of distances, angles, difference in elevation, and instruction and practice in the care and use of equipment. Areas covered are bearings; cross sections and profiles; note keeping; computations and field practice relating to traverses; an introduction to geodetic surveying; the basics of construction surveying; and the adjustment of surveying instruments. 2D and 3D coordinate transformation is introduced; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: Concurrent enrollment in MAT 1420

CET 1020 Engineering Materials (4) spring

This course studies the materials used in construction, including aggregates, cements, Portland cement concrete, timber, asphalts, bituminous concrete mixes, steel, and masonry. Sources, standard tests, and methods of manufacture and handling are covered. Portland cement concrete and bituminous concrete mixes are designed and tested. Laboratory work includes performance of standard tests and the preparation of technical reports of the tests; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None [Course fee: \$30]

CET 1030 CAD for Civil Engineering (3) spring

This course provides a solid foundation in CAD for the civil and environmental engineer. Course covers topics in AutoCAD and Surveying & Civil and requires access to AutoCAD and Carlson Surveying & Civil and Environmental outside of regular class hours. Students should have the ability to move files using Windows Explorer and be familiar with MS Word; 6 hours of laboratory per week. Prerequisite:

Basic computer skills

CET 1031 Engineering & Surveying Computer Applications I (3) fall

This course provides the student with a working knowledge of the use of computers for Civil and Environmental Engineering Technology. No prior computer training is required. The course is designed to introduce 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 including site, structural, and environmental drawings. Major graphic subjects include creating and editing CAD primitive and complex entities, dimensioning, drawing construction, layout, and output. Spreadsheets are also introduced with applications appropriate to civil and environmental engineering including calculations, quantities, estimates, and graphs; 6 hours of laboratory per week. Prerequisite: None [Course fee: \$35]

CET 1032 Engineering & Surveying Computer Applications II (3) spring

This course is a continuation of CET 1031 intended to provide proficiency in the creation and understanding of working drawings related to Civil and Environmental Engineering Technology. Topics include advanced CAD entity manipulation, customization, and programming. The student is introduced to a civil and environmental/survey software package used for site mapping, terrain modeling, and road and utilities design. In addition, related technologies such as Geographic Information Systems (GIS), their application, and data sources are discussed; 6 hours studio per week. Prerequisite: CET 1031

CET 2012 Surveying II (4) fall

A continuation of Surveying I, 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. Least squares adjustments are introduced. Cogo surveying software is an integral portion of the course; 2 hours of lecture, 6 hours of laboratory per week. Prerequisite: CET 1011 and 1032 and MAT 1420 [Course fee: \$35]

CET 2020 Hydraulics and Drainage (3) fall

The course includes an introduction to the fundamental concepts of fluids, fluids at rest, measuring devices, pressure diagrams, buoyancy, and steady flow. Calculations with computer applications are made for head losses, open channel flow, hydrology, and runoff. Pump characteristics and water distribution systems are also studied; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520 and PHY 1041 or 1022

CET 2030 Environmental Engineering & Science (3) fall

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 laboratory includes both field and indoor testing of water quality as well as field trips to environmental facilities; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: CHE 1031, MAT 1420, and PHY 1041 or 1022

CET 2040 Statics and 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. Laboratory work includes calculation of force and stress analysis, in addition to material testing; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520 and PHY 1041 or 1022

CET 2050 Civil and Environmental Design (4) spring

This course is designed to give the student experience with realistic civil and environmental engineering technology problems that require the use of knowledge and skills obtained in previous courses taken at Vermont Tech. Under faculty supervision, students are assigned design projects that could include site development plans; buildings and parking structures; bridges; water supply and treatment facilities; and roads and highways. The students develop graphic presentations, preliminary designs, calculations, and working drawings. The final phase of some projects may include estimating and construction schedul-

ing; 2 hours of lecture, 6 hours of laboratory per week. Prerequisite: CET 2012, 2020, 2030, and 2040
Corequisite: CET 2060, 2110, 2120 [Course fee: \$35]

CET 2060 Construction Estimates and Records (3) spring

A study of construction planning, equipment, and methods is incorporated with the study of construction contracts, specifications, and working drawings. Various types of plans and specifications are used as a basis for determining the construction methods and materials to be used on a project. These plans are also used for preparing cost estimates and CPM schedules. Earned value analysis and project accounting is introduced. Computers are used throughout the course for problem solving, estimating, and record keeping; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: CET 1011 and 1032

CET 2110 Mechanics of Soils (3) spring

A study of the basic principles and applications of soil mechanics as used in design and construction is covered. This course introduces knowledge of soil, its formation, actions, and uses. Included are studies of index properties; soil classification; exploration and sampling; compaction; and soil strength. 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 laboratory per week. Prerequisite: CET 2040

CET 2120 Structural Design (4) spring

This course is a study of the design of structural systems using wood, reinforced concrete, masonry, and steel. The design of various structural members and systems, such as tension members, beams, columns, connections, walls, and foundations is presented in accordance with relevant design codes. Laboratory work consists of the application of building and design codes to the design of structural systems and generation of detail drawings; 3 hours of lecture, 3 hours laboratory per week. Prerequisite: CET 2040

CET 3010 Evidence & Procedures for Boundary Line Location (3) spring

The purpose of this course is to familiarize land surveying students with the importance of locating the original boundary line between two or more tracts of land, the evidence that needs to be collected, and the procedures for this collection. This course is intended for students who wish to pursue a career in the field of land surveying. The course is also intended for people working in the field of land surveying who wish to obtain a license as a Professional Land Surveyor in the state of Vermont. 3 hours of lecture. Prerequisite: None

Chemistry (CHE)

CHE 1020 Introduction to Chemistry (4) fall/spring

Descriptive chemistry; atomic and molecular structure; chemical reactions; and the fundamentals of chemistry are studied. Laboratory work complements lectures and develops basic laboratory techniques. Previous successful completion of a course in chemistry is highly desirable; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

CHE 1031 General Chemistry I (4) fall/spring

This course is intended for engineering students and consists of the fundamentals of general and physical chemistry. Laboratory work is designed to amplify the lectures, provide an introduction to laboratory techniques, and introduce some methods of analysis currently used in industry; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: Math placement level 3

CHE 2060 Principles of Organic Chemistry (4) as required

This course is designed to enhance knowledge and skills in organic chemistry. It includes a general overview of the following organic compounds: aliphatic compounds (hydrocarbons, alcohols, ethers, aldehydes, ketones, carboxylic acids, and carbohydrates); cyclic compounds; and combinations of aliphatic and cyclic structures (including amino and nucleic acids). Important areas of organic chemistry are covered, including polymerization, hydrogenation, isomerization, photochemistry, and stereochemistry; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: CHE 1031

Computer (CIS)

CIS 1030 Introduction to Computers (3) as required

Students will become 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 laboratory per week. Prerequisite: None

CIS 1050 Introduction to Spreadsheets (1) fall/spring

This course introduces the student to the Microsoft operating system, e-mail, Internet, and the use of spreadsheets. Topics include the commands necessary to build a spreadsheet and make graphs; 1 hour of laboratory per week. Prerequisite: None

CIS 1080 Introduction to Spreadsheets & Database Management (2) fall/spring

This course introduces students to the use of e-mail, Web Services database functions, and the Internet, as well as to the use of 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 laboratory per week. Prerequisite: None

CIS 1120 Introduction to Information Technology (3) fall

This course introduces students to the world of IST across a broad range of topics. Topics include history of computing in society, career paths in computing, and the use of computers in the workplace; 3 hours of lecture per week. Prerequisite: None

CIS 1151 Website Development (3) fall

This course includes the introduction of web pages for commercial web sites 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 web page; 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 laboratory per week. Prerequisite: None

CIS 1152 Advanced Website Development (3) spring

Students learn intermediate skills and techniques used in webpage development. The major subject matter for this course includes server side scripting with PHP. Additional topics include applying formatting to text; creating documents that automatically display another page and that contain interactive Java Scripts; creation of and work with frames documents; examination of document styles and recommendations on improvements; HTML document creation/conversion tools; using XML to manage content; an introduction to database theory; and use of basic SQL programming; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 1151

CIS 2010 Computer Organization (4) spring

In this course, students gain a basic understanding of computer hardware. The students are introduced to binary data representation, pointers, and memory through the C language. This understanding expands to include the functioning of the CPU (including registers, ALU, and simple I/O) culminating in an introduction to assembly language; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2271

CIS 2022 C Programming for CPE (2) fall

This course is an introduction to programming using C for students with programming experience in another language; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2261

CIS 2025 C Programming (4) fall/spring/on-line

This course teaches students 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. In addition, this course will emphasize good software design techniques, programming style, and documentation. No prior programming experience is required. This course is offered in both classroom and on-line versions. Sufficient internet skills and the permission of the instructor are required to take the course on-line; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

CIS 2151 Computer Networks I (4)**fall**

This course introduces the student to network protocols. The course covers physical, data link, network, transport, and application layer protocols. The TCP/IP protocol suite is discussed in detail. IPX/SPX is also discussed. Topics include Ethernet and token ring networks, connectionless protocols, connection-oriented protocols, and application protocols such as SMTP, NNTP, and HTTP. Students learn about both hardware and software troubleshooting tools, security issues, and current topics such as IPv6. The way network software is written, both on the server side and the client side, is also covered; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2025 or 2271

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. Some topics in computer security are also discussed. Unix, Windows Server 2008, and Windows 7 are the specific systems currently studied; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2025, 2271, or 2280

CIS 2235 Advanced System Administration (4)**spring**

This course focuses on the tasks involved in managing information technology systems at the enterprise level. Topics covered include Active Directory and LDAP administration; router administration; security in a networked infrastructure; DNS, NIS, and DHCP administration; VPN and firewall integration; and network management. A series of case study situations are presented and applied in a lab environment providing students with real-world experiences reinforcing the concepts covered during the lectures; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151 and 2230

CIS 2260 Object-Oriented Programming (3)**fall**

This course introduces students to the concepts of programming with abstract data types and object-oriented programming. It uses Java to cover classes, inheritance, and polymorphism. The course also builds on the prerequisites to provide students with more advanced exposure to software design, implementation, debugging, and documentation; 3 hours of lecture per week. Prerequisite: CIS 2010, 2025, or 2271

CIS 2261 Introduction to Java Programming I (4)**fall**

An introduction to programming using Java for students with little or no programming experience; 3 hours of lecture per week. Prerequisite: None

CIS 2262 Introduction to Java Programming II (2)**spring**

A continuation of CIS 2261, this course develops a more solid foundation for future programming; 3 hours of lecture per week. Prerequisite: CIS 2261

CIS 2271 Java Programming (4)**fall**

This course will introduce the student to basic concepts of Java and Object Oriented Programming (OOP). The course begins with basic concepts of OOP. These include classes, objects, inheritance, polymorphism, and object oriented design. The course will then cover the language features of Java. The topics in this section are: program structure; statement and field types; operators; expressions; and control structures. The course then returns to OOP features of Java, focusing on object data types, strings, methods, classes, and constructors. The final section addresses graphical user interface (GUI). The topics are: applets, GUI components (e.g. buttons), event processing, and frames; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

CIS 2280 Perl Programming (2)**as required**

This course continues the student's training in programming by introducing the use of the scripting language, Perl. Students are introduced to the Linux operating system. The basic concepts of programming are reviewed using Perl to demonstrate those concepts. Concepts unique to Perl, such as regular expression handling and hashes, are introduced. The emphasis in the course is on using Perl as a tool to get things done rather than only as a vehicle to explain how to program. Examples and assignments are drawn from topics related to system administration, web programming, and application programming; 2 hours of lecture per week. Prerequisite: CIS 2010, 2025, or 2271

CIS 2320 Software Quality Assurance and Testing (3) fall

Students are introduced 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, user interface testing, and current test support tools; 3 hours of lecture per week. Prerequisite: CIS 2010, 2271, or 2025

CIS 2411 Introduction to E-commerce (3) spring

This class is an introductory e-commerce course wherein students learn the business aspects of building and managing e-commerce sites. Students will gain an understanding of tools, technologies, and concepts as well as the processes that comprise the technical infrastructure of e-commerce sites. They will be able to document thin architecture and solve problems with hardware, software, and site design; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 1151

CIS 2450 Advanced Web Technologies (3) fall

This course introduces the student to advanced use of web technologies, methods, and practices. The use of technologies such as PHP, XML, AJAX, and major web development frameworks are discussed and implemented in a laboratory environment; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151, 1152 and concurrent enrollment in CIS 2230

CIS 2610 Topics in Information Technology (3) fall

This course is an in-depth investigation of a topic or technology of current interest to the information technology infrastructure community; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151 and 2230

CIS 2620 Topics in Software Engineering (3) fall

This course provides students with the opportunity to integrate the topics presented throughout the curriculum, as well as to explore additional specific topics that are relevant to the current state of the software engineering field. At the discretion of the instructor, students may work on a semester-long project, do library research, or develop a significant program or system. The precise content and nature of this course varies from year to year, depending on current industry needs; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2025 or 2262 or 2271

CIS 2720 Current Topics in Computer Engineering (3) spring

This course provides students the opportunity to integrate the topics presented throughout the curriculum as well as to explore additional specific topics that are relevant to the current state of the field. Recent topics have included HTML authoring, Java, CGI scripting, Windows programming, X11/Qt programming, and databases. At the discretion of the instructor, students may work on a semester-long project, do library research, give an oral presentation, write a significant program, or build significant electrical hardware. The precise content and nature of this course varies from year to year, depending on current industry needs; 2 hours of lecture, 2 hours laboratory per week. Prerequisite: ELT 1080 and 2050 CIS 2151, concurrent enrollment in CIS 2230

CIS 2730 Software Engineering Projects (3) fall/spring

This capstone course involves the development of a group project. The development effort will be combined with an introduction to systems development and life cycle. Students will also receive an introduction to orally presenting technical information to a technical audience. Each group will present their project design and the final project; 2 hours of lecture and 2 hours of laboratory per week. Prerequisite: CIS 2025 and 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. Students are required to complete a project in which they either implement a real-world example relational database or, at the instructor's discretion and approval, 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 web sites; alternative database paradigms; database design/engineering tools; and underlying implementation of databases; 3 hours of lecture, 2 hours of

laboratory per week. Prerequisite: CIS 2230

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 programming languages, selected advanced object-oriented topics, and an introduction to the theory of computation as it applies to programming languages. Students will gain useful experience with at least two new languages (one chosen by the instructor and one chosen by the student); 3 hours of lecture per week. Prerequisite: CIS 3050

CIS 3050 Algorithms and 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, sorting, and string matching. It also covers selected other topics such as encryption, data compression, and image processing; 3 hours of lecture per week. Prerequisite: CIS 2260 or instructor permission

CIS 3080 Issues in Information Technology (3) as required

This course is an in-depth study of the uses of and issues related to computers and information systems in society. Topics explore the benefits and professional impact of continuing career preparation, career progression, and outreach to the community, ethical development, and ethical behavior. Controversies and alternative points of view are evaluated on issues such as professional ethics and professional responsibility. Students research and write extensively on course topics; 3 hours of lecture per week. Prerequisite: Junior standing

CIS 3152 Network Programming (4) spring

This course in networks has an emphasis on the upper layers of the OSI model and network programming. Topics include TCP/IP protocol behavior (including coverage of IPv6), client/server programming, and at least one application level protocol such as HTTP or SMTP/MIME. An introduction to character sets and XML is also presented. In addition, at least one remote procedure call system is covered; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151 and CIS 2010 or 2025

CIS 3170 History of the Theory of Computation (3) fall

In this course, the history of computers and early calculators will be examined. Students will learn the principles of early computational devices and investigate how the concepts utilized in these devices are implemented in modern computers. Particular attention is focused on Boolean logic. Frege formula language, Turing machines, implications of Shannon's Limit, and Moore's Law will be studied. The course is also offered on-line; 3 hours of lecture per week. For non-computer students (General Education: SS) Prerequisite: Junior standing

CIS 3210 Routing Concepts & Wide Area Networks (4) fall

This class is an introduction to wide area and local area routing concepts, methods, fundamentals of routing protocols, and packet forwarding. Routing protocols such as RIPv1, RIPv2, EIGRP, and OSPF are analyzed. Also discussed are distance vector and link state routing protocols and their implementation factors in an enterprise network environment. This course utilizes Cisco networking equipment and simulation tools for laboratory work and assignments; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151 and concurrent enrollment in CIS 2230

CIS 3250 Advanced Network Architectures (4) spring

This course teaches students how to implement, monitor, deploy, and maintain a network in a converged enterprise environment. Students will learn how to plan, configure, and verify the implementation of complex enterprise switching solutions. The course also covers the secure integration of VLANs, WLANs, voice, and video into networks. Comprehensive labs emphasize hands-on learning and practice to reinforce the skills learned in class; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2151, 2230, and 3210

CIS 3310 Artificial Intelligence (3) as required

Students learn the algorithms and data structures used in artificial intelligence and to program a range

of approaches that computers use to emulate intelligence, such as planning, knowledge representation, learning, decision-making, and game-playing; 3 hours of lecture per week. Prerequisites: CIS 2025 or 2271 and MAT 2120, 1420, or 1520

CIS 3311 Systems Development Engineering I (3) fall

This course is an in-depth study of the systems development, deployment, and monitoring of an information technology system. All aspects of the systems development cycle are covered. This course covers the RFP/RFQ process, technology requirements, systems architecture, and systems engineering processes. The role of the project management and aspects of large-scale systems are also covered; 3 hours of lecture per week. Prerequisite: CIS 2151

CIS 3312 Systems Development Engineering II (3) spring

This course is an in-depth study of the systems development, deployment, and monitoring of a substantial information technology system. The course considers issues such as rolling versus big band deployments, transition periods, capacity planning, heterogeneous versus homogeneous environments, optimizing deployments, and monitoring tools for all forms of software and hardware information technology aspects of large-scale systems; 3 hours of lecture per week. Prerequisite: CIS 2151 and 3311

CIS 3610 Topics in Information Technology (3) fall

This course provides students with the opportunity to integrate the topics presented throughout the curriculum as well as to explore additional specific topics that are relevant to the current state of the information technology field. At the discretion of the instructor, students may work on a semester-long project, do library research, or develop a significant program or system. The precise content and nature of this course varies from year to year, depending on current industry needs; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2235 and 4150 or CIS 3311

CIS 3620 Topics in Software Engineering (3) fall

This course provides students with the opportunity to integrate the topics presented throughout the curriculum as well as to explore additional specific topics that are relevant to the current state of the software engineering field. At the discretion of the instructor, students may work on a semester-long project, do library research, or develop a significant program or system. The precise content and nature of this course varies from year to year, depending on current industry needs; 3 hours of lecture per week. Prerequisite: CIS 4150, 4120

CIS 4020 Operating Systems (4) fall

In this course, students study the internal workings of modern operating systems. Topics include multiprocessing, memory management, file systems, and device drivers. Distributed operating systems and real time operating systems are also discussed. As part of this course students write a kernel module and/or device driver for an operating system chosen by the instructor; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CIS 2230 and 3050

CIS 4030 GUI Programming (3) fall/on-line

Modern Graphical User Interface (GUI) design and implementation methods are studied. The course uses Java as the base language. Industry standard libraries, such as Swing and Open GL, are used for programming coursework; 3 hours of lecture per week. Prerequisite: CIS 2271 or 3030

CIS 4040 Computer Security (3) spring

This course focuses on security issues associated with computers and computer networks. The course starts by covering cryptographic topics such as symmetric and public key systems, digital signatures, secure hashes, cryptographic random number generation, and message authentication codes. Network security topics are also covered including secure protocols (SSH, SSL, IPSec), network attack methods, network authentication protocols (for example, 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, and 2025 or CIS 2271

CIS 4050 Compiler Design (3) spring

This course investigates how languages are implemented and gives the student enough knowledge to build specialized “mini languages” for niche applications. Students will use compiler generation tools, such as Lex

and Yacc, and will create some hand-built components. Although some theory is presented, the emphasis is on implementation (programming) rather than theorem-proving. Most programming is done in C, but other languages (C++, Java) are also used; 3 hours of lecture per week. Prerequisite: CIS 3030 and 3050

CIS 4120 Systems Analysis and Design (3) spring

This course addresses the methodology used in gathering data, analyzing data, and determining user requirements for information processing using advanced systems analysis techniques and the associated techniques used in designing solutions that can then be programmed as application software for use on computer-based systems; 3 hours of lecture. Prerequisite: Junior standing in CIS or CPE and CIS 2260

CIS 4140 Human Computer Interaction (3) as required

This 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 and 2260

CIS 4150 Software Engineering (3) fall

This course is chiefly concerned with the application of engineering principles to the all-too-chaotic process of software development. The student will learn how the concepts of repeatability, modularity, traceability, maintainability, and reusability affect the architecture and design of software systems. The software life cycle and how it is supported by various methodologies will be explored, as well as the ramifications of differing team sizes to the selection of traditional versus agile methods. The student will be shown how documentation techniques, modeling languages, and CASE tools can be used to minimize miscommunications and ensure that the system desired is the system that is eventually built; 3 hours of lecture per week. Prerequisite: Concurrent enrollment in CIS 2260

CIS 4210 Computer Graphics (3) as required

This course deals with computer generation of realistic images of 2- and 3- dimensional scenes. This course involves substantial computer programming; 3 hours of lecture per week. Prerequisite: MAT 1520 and concurrent enrollment in CIS 3050

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: CIS 3050, MAT 2532, and 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 and 3050

CIS 4310 Computer Forensics (3) fall

This class is an introduction to digital forensic methods, practices, technology, and legal concerns. Students will consider 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 and 2235

CIS 4711 Project I (2) fall

This course is a largely self-directed senior project in which students demonstrate their mastery of the subjects covered in their program; 1 hour of lecture, 3 hours of laboratory per week. Prerequisite: Senior standing in a computer program [Course fee: \$50]

CIS 4712 Project II (3) spring

Completion and final presentation of the senior project begun in the fall. Regular progress reports and a formal presentation at term's end are required. This presentation occurs in front of students, departmental faculty, and invited guests (including potential employers); 1 hour of lecture, 6 hours of laboratory per week. Prerequisite: CIS 4711 or 4721

CIS 4721 Information Systems Technology Senior Project I (2) fall

This course is a largely self-directed senior project in which students demonstrate their mastery of the subjects covered in the BS.CSE or BS.CIT programs; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: Senior standing in the CSE or CIT programs

CIS 4722 Information Systems Technology Senior Project II (3) spring

This course is the completion and final presentation of the senior project begun in the fall. Regular progress reports and a formal presentation at term's end are required. This presentation occurs in front of students, departmental faculty, and invited guests (including potential employers); 1 hour of lecture, 4 hours of laboratory per week. Prerequisite: CIS 4711 or 4721

CIS 4730 Information Systems Technology Projects (3) spring

This capstone course combines a major project with a review of systems development and life cycle including select human and organization behavior issues; a survey of information technology-associated literature focusing on the role of information sciences in society; the psychological underpinnings of design; experimental technologies; and future-looking science fiction. In addition to the significant project spanning at least the three stages of the life cycle, reflective activities include development barriers, use interaction, analyzing project performance, and planning for future issues; 1 hour of lecture, 3 hours of laboratory per week. Prerequisite: Senior standing in the CSE or CIS programs

Construction (CPM)

CPM 1000 Freshman Seminar (1) fall

This course is designed to facilitate 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/site resources; time management; note taking; introduction to career opportunities; and program-specific topics including construction program issues, the building construction industry, and professional development; 1 hour of seminar per week; graded Pass/No Pass. Prerequisite: None

CPM 1010 Electrical/Mechanical Systems (3) spring

The student is introduced to the major environmental systems in a building: plumbing; heating, cooling, and ventilation; and electrical and illumination. Also included is an introduction to the influences of the natural environment on the built environment and a consideration for how these effect energy use and conservation. The building codes that govern the design of the various environmental systems are studied; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: CPM 1031 and 1021 or instructor permission

CPM 1021 Construction Graphics I (1) fall

This course prepares students to interpret working drawings for residential and light commercial construction projects by teaching them to make their own basic architectural drawings on a drafting board. Students learn to draw plans, elevations, sections, and details and to understand how they relate to each other. Informal sketching techniques are practiced and used throughout this course and others in the program; 3 hours of laboratory per week. Prerequisite: None

CPM 1022 Construction Graphics II (1) spring

This course applies the lessons of CPM 1021 to the study and interpretation of construction specifications and drawings for residential and light commercial projects; 3 hours of laboratory per week. Prerequisite: CPM 1021 [Course fee: \$25]

CPM 1031 Residential Construction Systems (3) fall

Students study residential construction methods and materials for the following systems: foundations; framing; insulating; interior and exterior finish; and roofing. They learn about the CABO building code, new products, and estimating material quantities; 3 hours of lecture per week. Prerequisite: Concurrent enrollment in CPM 1032

CPM 1032 Construction Lab (2) fall

Students are introduced to the basic materials and methods of commercial construction; 6 hours of

laboratory per week. Prerequisite: Concurrent enrollment in CPM 1031.

CPM 1111 Commercial Construction Systems (4) **spring**

This course introduces students to the construction materials and installation methods used in commercial projects. Students study soils and foundation types; heavy timber frame construction; masonry, concrete and steel construction systems; and commercial roofing, insulation, and cladding systems. They also learn about the IBC building code. CPM 1111 is the same as ARC 1210 for the lecture portion; 4 hours of lecture per week. Prerequisite: CPM 1031

CPM 2010 Construction Estimates (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. Included are: organizing the 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. Familiarization with computer estimating software applications is included; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: CPM 1031, 1111, 1022 and MAT 1100 or 1420

CPM 2020 Construction Project Management (3) **fall**

This course introduces students to the principles of construction project management. Included are the design/construction process, 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. An introduction to design-build and construction manager contracting is included; 3 hours of lecture per week. Prerequisite: None

CPM 2030 Elementary Theory of Structures (4) **spring**

This course introduces the student to the methods used in the preliminary analysis and design of building framing systems and why certain materials and member sizes are used. An introduction to statics and strength of materials includes basic analysis of framing systems and properties of materials used in residential and commercial construction. The student is introduced to building and design codes and the study of building loads and how the building reacts to the loads. General structural system using wood, steel, concrete, and masonry elements including pre-engineered products are studied; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1100 or 1420, PHY 1030, CPM 1031 and 1111

CPM 2050 Construction Management Software (2) **fall**

This course exposes students to several commonly-used computer applications for construction management including advanced spreadsheets (Excel), estimating (Winest), and scheduling (Primavera Suretrak). Students will learn the software by working through tutorial-type exercises in a weekly computer laboratory run by an instructor; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: CET 1031

CPM 2060 Field Engineering (3) **fall**

This course introduces students to the fundamentals of construction field engineering, survey, and building layout. Students will learn 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 will be used to balance angles, make distance corrections, and compute areas and volumes; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1100 or equivalent [Course fee: \$25]

CPM 2720 Construction Supervision (1) **fall**

This is an elective course for Construction Management seniors. The intent is to give these students practice supervising first-year students during their Construction Lab and managing the CPM job site. This course is repeatable for additional credit; 3 hours of laboratory per week. Prerequisite: Instructor permission

CPM 2730 Construction Seminar and Project (4) **spring**

This course ties together all the previous courses for the CPM program. The lecture portion utilizes professionals from all phases of the construction process as guest speakers. In the laboratory, students read and interpret the contract and specifications for a commercial project of significant scope. Through individual and group work on this project, they develop a complete estimate of cost, construction time, a project schedule, a schedule of values, a safety plan, an environmental plan, and a quality control plan;

2 hours of lecture, 6 hours of laboratory per week. Prerequisite: Sophomore standing

CPM 2801/2802 Construction Internship/Internship Review (0/1) summer/fall

This is a required part of the CPM curriculum and involves a ten-week summer cooperative education experience that will broaden student understanding of real world construction and management and an internship review seminar in the subsequent fall term; graded Pass/No Pass. Prerequisite: Departmental permission [Course fee: \$250]

CPM 3010 Construction Estimates II (3) spring

This course covers detailed estimations of residential, commercial, and civil construction projects. Value engineering; pre-construction services; preliminary budgets; materials; labor and overhead costs; worker productivity, constructability reviews; proposals; and bids are covered. Includes introduction to Building Information Modeling (BIM) and On-screen Take-off (OTF); 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: CPM 2010

CPM 3020 Construction Documents (3) spring

This course covers analysis, creation, and organization of construction documents. Students will conduct takeoffs and divisional cost controls; create and track submittals, shop drawings, requests for information, and proposals; Interpret specifications, contracts and architectural, civil, and structural drawings; and interpret LEED, International Building Code, and local zoning and life safety requirements; 3 hours of lecture per week. Prerequisite: CPM 2020 or instructor permission

CPM 3030 Concrete and Steel Lab (3) spring

This course covers current methods and equipment used in concrete, masonry, and steel construction. Laboratory exercises emphasize means and methods of commercial, engineering, and industrial construction. Reinforcement techniques; concrete form design and construction; and testing based on American Concrete Institute standards are covered; 3 hours of studio per week. Prerequisite: CPM major [Course fee: \$140]

CPM 4010 Contract Negotiations (3) fall

This course focuses on collective representation, including the history of collective bargaining and employment laws. Emphasis is placed on the unique aspects of the construction industry and practical approaches to construction labor issues are addressed. Local, state and federal labor laws and their effect on contract negotiations are also taught. The oral communication graduation standard will be evaluated in this course; 3 hours of lecture per week. Prerequisite: CPM 2020

CPM 4020 Advanced Field Engineering (3) fall

This course focuses on advanced building construction layout, computer applications (including Land Desktop and SurveyPro), and an introduction to geographic information systems, global positioning systems, and laser imaging; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: ARE 2040 or CPM 2060, CET 2012

CPM 4030 Construction Safety and 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. Prerequisite: None

CPM 4110 Construction Permits (3) spring

This is an in-depth study of zoning, building, and life safety permits. Special emphasis is placed on contract implementation within the context of permit requirements. Analysis of the International Building Code, life safety, and development control laws are considered; 3 hours of lecture per week. Prerequisite: CPM 3020 or instructor permission

CPM 4120 Project Planning and Finance (3) spring

This course is an investigation of project planning and scheduling and the relationship to construction financing during all phases of project development. Topic items include control theory, productivity calculations, progress payments, permanent loans, construction loans, sources of mortgage funds, and

venture capital; 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 will be 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 are discussed, as are motivational and leadership concepts as they apply to construction; 3 hours of lecture per week. Prerequisite: Junior standing

CPM 4801 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; graded Pass/No Pass. Prerequisite: CPM major in good academic standing

CPM 4802 Internship Review (1)

fall

This course is used to review and evaluate the effectiveness of the internship experience and quantify the learning outcomes as they pertain to the major and the construction practices career field; graded Pass/No Pass. Prerequisite: CPM 4801 [Course fee: \$250]

Dental Hygiene (DHY)

DHY 1011 Pre-clinical Dental Hygiene (4)

fall

This course is designed to begin to provide the didactic and clinical framework necessary to the practice of dental hygiene. The didactic component consists of learning units covering preventive dental hygiene theory. The primary emphasis of the clinical component is placed on learning the techniques of basic dental hygiene instrumentation. Students will begin to integrate their knowledge of theory and practice through simulated patient experiences on manikins and student partners; 3 hours of lecture, 6 hours of laboratory per week. Prerequisite: None, Corequisite: DHY 1012 [Course fee: \$65]

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. The emphasis is placed on the clinical component of dental hygiene practice. Students will integrate their knowledge of dental hygiene theory and practice by providing dental hygiene care to consumer patients throughout the semester. The didactic and clinical components of this course will challenge students to develop problem-solving and critical thinking skills; 1.5 hours of lecture, 8 hours of laboratory per week. Prerequisite: DHY 1011 and 1021

DHY 1021 Oral Tissues I (3)

fall

Oral Tissues I will encompass an in-depth study of the areas of dental terminology, tooth morphology, and tooth tissues. The course includes both didactic and activity sessions to facilitate learning and retention of the concepts; 2 hours of lecture, 2.5 hours activity session per week. Prerequisite: None

DHY 1022 Oral Tissues II and Medical Emergencies (3)

spring

This is a continuation of DHY 1021 emphasizing head and neck anatomy, oral embryology, odontogenesis, and medical emergencies; 2 hours of lecture per week, 2 hours of activity session per week. Prerequisite: DHY 1011 and 1021 and BIO 2011, Corequisite: DHY 1012

DHY 1030 Dental Radiology (3)

spring

Dental Radiology is the study, demonstration, and practice of the fundamentals of dental x-ray production and intraoral and extraoral radiographic techniques utilizing conventional film and digital imaging. The student will learn to recognize the radiographic appearance of normal anatomical structures and common oral disorders; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: DHY 1011, 1021 and BIO 2011, Corequisite: DHY 1012

DHY 2010 Dental Materials (3)

fall

This course is designed to emphasize the clinical and theoretical concepts of dental materials and their clinical application. There is a blend of lecture with laboratory time to provide the students with

adequate opportunity to manipulate materials introduced during the didactic portion of the course. Knowledge in the use of dental materials will allow the dental hygienist to better promote and explain the necessary preventative and restorative needs of the patient; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: DHY 1012, 1022, 1030, and BIO 2012, Corequisite: DHY 2721

DHY 2020 General Pathology and Clinical Dental Pharmacology (3) fall

Pathology and Pharmacology is an introduction to clinical pathology and the pharmacological management of the treatment of dental patients. The student will learn to integrate medical diseases commonly found in dental hygiene practice with the pharmacological agents used in management of those diseases; 3 hours of lecture per week. Prerequisite: DHY 1012, 1022 and BIO 2012, 2120, Corequisite: DHY 2721

DHY 2030 Periodontics (3) fall

This is the study of the morphologic and functional aspects of the supporting dental structures. The student will learn to recognize diseases of the periodontium and will learn therapeutic measures for the treatment of these diseases; 3 hours of lecture per week. Prerequisite: DHY 1012, 1022, 1030, and BIO 2012, Corequisite: DHY 2721

DHY 2210 Community Oral Health (3) spring

This course is an introduction to the concepts of community oral health with emphasis on advanced research designs, community oral health issues, the importance of public health programs in the community, and prevention modalities encompassed in dental public health programs. This course contains a community service component wherein the processes of assessment, planning, implementation, and evaluation are addressed in addition to an introduction to sociology with an emphasis on core models and concepts associated with key sociological perspectives; 3 hours of lecture per week. Prerequisite: DHY 2010, 2020, 2030, and 2721, Corequisite: DHY 2722

DHY 2220 Oral Pathology (2) spring

Oral Pathology is designed to integrate the knowledge gained from general pathology and basic anatomical, physiological, and dental sciences with the concepts of diseases. Emphasis will be placed on helping students understand the etiology and histopathology of specific oral diseases. Oral neoplasia, pulpal pathology, microbial diseases, developmental disturbances, and selected systemic diseases will be highlighted. The process of formulating a differential diagnosis of oral lesions based on this information will also be emphasized; 2 hours of lecture per week. Prerequisite: DHY 2010, 2020, 2030, and 2721, Corequisite: DHY 2722

DHY 2721 Clinical Dental Hygiene II (5) fall

This course is a continuation of DHY 1012 and involves clinical practice with patients from Class 0 to Class 5 periodontal conditions. Topics related to patient care are discussed in the classroom setting and dental hygiene care is provided for children, adults, and special-needs populations in the clinical setting; 1.5 hours of lecture, 14 hours of clinic per week. Prerequisite: DHY 1012, 1022, 1030, and BIO 2012

DHY 2722 Clinical Dental Hygiene III (6) spring

This course is the continuation of DHY 2721 and involves clinical practice with patients from Class 0 to Class 5 periodontal conditions. Topics related to patient care are discussed in the classroom setting and dental hygiene care is provided for children, adults, and special-needs populations in the clinical setting. The administration of local anesthetics will be covered; 1.5 hours of lecture, 14 hours of clinic per week. Prerequisite: DHY 2010, 2020, and 2721

DHY 3010 Evidence Based Decision Making in Dental Hygiene (3) fall

This course will provide fundamental knowledge about evidence-based decision making. It will provide 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 lecture per week; offered on-line. Prerequisite: DHY 2722 or equivalent

DHY 3015 Contemporary Issues in Dental Hygiene (3) fall

This course examines current societal and professional issues and their impact on dental hygiene practice. The student will discuss the graying of America and its impact on the delivery of dental care.

Students will examine the varied roles of the dental hygienist and discuss the dental hygienist's role in increasing access to dental care. Students will research and compare traditional and alternative practice models and propose changes to improve dental care delivery. Changing technology in dentistry and dental hygiene will also be discussed; offered on-line. Prerequisite: DHY 2722

DHY 3020 Advanced Periodontics (3) fall

This course will expand on the student's existing knowledge of current concepts in etiology; risk factors; assessment; treatment planning; implementation and evaluation of contemporary treatment modalities; and maintenance therapy. The interrelationship of periodontal treatment with other dental specialties will be discussed along with an investigation of the periodontal literature. Emphasis will be placed on the dental hygienist's role in periodontal therapy; 3 hours of lecture per week; offered on-line. Prerequisite: DHY 3010

DHY 3030 Dental Hygiene Methodology and Leadership (3) spring

This course is designed to provide the student with an introduction to educational concepts and theory relative to dental hygiene education, as well as theories, concepts, and principles of leadership in the dental hygiene educational setting. Topics included are course development and design; goals and objectives; principles of learning; learning styles and motivation; classroom instruction using educational media and software; and leadership skills; 3 hours of lecture per week; offered on-line. Prerequisite: DHY 3010

DHY 4010 Advanced Community Oral Health (3) fall

This course is an in-depth study of the current issues surrounding today's public health care delivery system. Issues addressed include: access to oral health care, quality assurance, dental care financing, and regulatory approaches to oral health care delivery in the public sector. Oral health care issues will be incorporated throughout the course with special emphasis on public health policy and practice; offered on-line. Prerequisite: DHY 3010

DHY 4610 Dental Hygiene Practicum (6) fall

This course is designed to provide the student an opportunity to apply knowledge of a chosen professional role through a hands-on experience. This course will use student selected sites, on or off campus, to develop the expanding role of the dental hygienist in the health care system; 8 hours of practicum per week. Prerequisite: DHY 3020, 3030, and 4010

Diesel (DSL)

DSL 1010 Steering, Suspension Systems, and 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; conventional suspension systems; air suspension systems; wheels and tires; and alignment; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

DSL 1020 Diesel Power Systems (4) spring

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 laboratory per week. Prerequisite: None

DSL 1040 Basic Diesel Electrical/Electronics Systems (4) fall

This course is intended to give students a thorough understanding of diesel electrical and electronic systems and to teach diagnostic and troubleshooting skills. Topics include Ohm's Law, basic circuit devices, circuit faults, basic computers, networks, feedback circuits, batteries, and charging and starting systems. The student will become familiar with various types of test equipment, diagnostic charts, and wiring diagrams; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

DSL 1050 Preventive Maintenance (3) spring

This course provides students with an understanding of the development and administration of preventive maintenance programs. Topics include PM schedules; types of service; 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 laboratory per week. Prerequisite: None

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 laboratory 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 system. 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 Injector's (UEI); Bosch, Detroit Diesel, Caterpillar, Cummins DFI systems; governors; system diagnosis and service; and computerized fuel control systems; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

DSL 2020 Chassis Electrical and Electronic Systems (4) spring

This course is intended to give students a thorough understanding of advanced diesel chassis electrical and electronic systems and to teach diagnostic and troubleshooting skills. Topics include advanced networks and multiplexing; A/C systems; lighting systems; instrument panels; wiper and washer systems; alarm systems; collision avoidance systems; supplemental restraint systems; ground based communication systems; satellite based communication systems; and accessory systems; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: DSL 1060

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; components; hydraulic symbols and engineering drawings; pilot systems; and electronic control systems; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: DSL 1060

DSL 2040 Power Transmission (3) spring

This course is intended to give students a thorough understanding of power transmission systems and to teach 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; power-train management and electronically controlled transmissions; Allison Commercial Electronic Control (CEC) system; Eaton Auto-shift transmission; drive shafts; final drives; and tracks; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: DSL 1040 and concurrent enrollment in DSL 2020

DSL 2060 Fabrication (3) spring

This course provides a comprehensive study of manufacturing processes and fabrication. Topics include manufacturing processes; use of fabrication tools; job planning; basic gas and MIG welding; advanced welding; rodding and tubing of hydraulic cylinders; and drive-shaft repair; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

DSL 2801/2802 Summer Internship/Internship Review (0/1) summer/fall

A 400 hour internship at a diesel repair facility or OEM dealership is required. The Internship Review provides for a critique of the internship; graded Pass/No Pass. Prerequisite: Departmental permission [Course fee: \$250]

Economics (ECO)

ECO 2020 Macroeconomics (3) fall

The course consists of an introduction to basic principles of macroeconomic analysis and a survey of the economic government, household, and business sectors. The student is introduced to the analysis of the level and variations of the national income; government fiscal and monetary policies; money; the

banking system; and the problems of inflation and unemployment; 3 hours of lecture per week. (General Education: SS) Prerequisite: Math placement level 2 or higher or instructor permission

ECO 2030 Microeconomics (3)

spring

This course covers the theory and analysis of market structures, prices, profits, wages, interest, and international trade. Developments in such areas as agriculture and the balance of international payments are examined by means of reading and class discussion about current economic events; 3 hours of lecture per week. (General Education: SS). Prerequisite: Math placement level 2 or higher or instructor permission

Education (EDU)

EDU 2051 Teaching Methods I (3)

fall

This course is designed to provide in-depth coverage of technical center operations and procedures for teachers who are new to the field of Trade and Industry teacher licensure. The yearlong course includes a classroom component and a field practicum. The classroom component provides specific information on standards based education; program competencies; competency and employability skill lists; and federal and state rules and regulations. The unique mandates of technical education are reviewed and implemented by course participants who must be teaching at least one half day each week in a technical center under supervision of a peer coach. The practicum component of the course requires formal lesson plans, classroom/laboratory observations, and evaluation conferences with the course teacher and a field supervisor. Observations are conducted three times each semester; graded Pass/No Pass. Prerequisite: Instructor permission

EDU 2052 Teaching Methods I (continued) (3)

spring

This class continues curriculum from EDU 2051. Prerequisite: EDU 2051

EDU 2061 Teaching Methods II (3)

fall

This course is designed to provide in-depth coverage of technical center operations and procedures for teachers who are new to the field of Trade and Industry teacher licensure. The yearlong course includes a classroom component and a field practicum. The classroom component provides specific information on standards based education; program competencies; competency and employability skill lists; and federal and state rules and regulations. The unique mandates of technical education are reviewed and implemented by course participants who must be teaching at least one half day each week in a technical center under supervision of a peer coach. The practicum component of the course requires formal lesson plans, classroom/laboratory observations, and evaluation conferences with the course teacher and a field supervisor. Observations are conducted three times each semester; graded Pass/No Pass. Prerequisite: Instructor permission

EDU 2062 Teaching Methods II (continued) (2)

spring

This class continues curriculum from EDU 2061. Prerequisite: EDU 2061

EDU 2802 Educational Externship (1)

fall

This is an education externship for continuing technical education students, taken in conjunction with EDU 2061; graded Pass/No Pass. Prerequisite: Concurrent enrollment in EDU 2061

Electrical Engineering (ELT)

ELT 1031 Electrical Circuits I (4)

fall

This course is an introductory study of DC and AC electrical circuits. Course content includes the basic ideas of electrical charge, current, voltage, resistance, energy, and power. Capacitance, inductance, and the transient behavior of RC and RL circuits are also studied. 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. Laboratory 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 laboratory per week. Prerequisite: Concurrent

enrollment in MAT 1420 [Course fee: \$240]

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 transformers, poly phase circuits, frequency response, and response to non-sinusoidal signals. Laboratory 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 laboratory per week. Prerequisite: ELT 1031 and MAT 1420, concurrent enrollment in MAT 1520

ELT 1051 Presentation Graphics I (1)

fall

This course provides hands-on experience in creating technical presentations using many different software programs including MS Word, Excel, and PowerPoint. Topics include terminology, layout, chart creation, effective chart usage, and integrating text, graphics, and audio. Upon successful completion of this course, students will be able to assemble and demonstrate an effective presentation. Additional topics covered are the use of analog and digital simulation tools such as MultiSim, podcasting, vodcasting, and LabVIEW; 3 hours of laboratory per week; Prerequisite: Concurrent enrollment ELT 1011 or 1031 and MAT 1112 or 1420

ELT 1052 Presentation Graphics II (1)

spring

This is a continuation of ELT 1051, exposing students to the software tools commonly encountered in electrical engineering. These include applications involved in schematic capture, circuit analysis, and printed circuit board (PCB) creation and other computer-aided design (CAD) tools. The fundamentals of web page documentation are also presented. Online lectures allow students to be flexible in how and when they complete the weekly assignments. At the end of the course, there will be a project that will use all of the tools explored in the course; 3 hours of laboratory per week. Prerequisite: ELT 1051 and 1110, concurrent enrollment in ELT 1032

ELT 1080 Electronics for Computer Engineering (4)

fall/spring

This course gives students an overview of topics from solid-state electronics. Topics include diode circuits; 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 laboratory per week. Prerequisite: ELT 1031, MAT 1420

ELT 1101 General Electronics I (4)

fall

This is an introductory course for students who are not majors in the EET or the CPE programs. It presents a survey of the fundamental principles of electrical theory in order to provide basic understanding for further study and application in other areas. Key topics in direct current (DC) and alternating current (AC) circuits are presented including current, voltage, resistance, capacitance, inductance, reactance, impedance, energy, power, electrical sources, magnetism, and transformers. A brief introduction to semiconductors is presented. Common measurement instruments are discussed and used in laboratory experiments; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: Concurrent enrollment in MAT 1420

ELT 1102 General Electronics II (4)

as required

This course continues the topics from ELT 1101 as a survey of the fundamental principles of electronic theory for students who are not majors in the EET or CPE programs. Prerequisite: ELT 1101

ELT 1110 Introduction to Digital Circuits (4)

fall/spring

This first course in digital electronics introduces hardware programmable (wired) digital structures from a functional perspective. The logic function (its representation, simplification, and implementation) is developed as a central concept. Two network classes are identified and analyzed: combinatorial and sequential. The nature of digital signals, number systems, the algebra of logic, and graphical minimization are among the topics investigated. Common logic functions are realized in the laboratory using currently popular digital integrated circuits of varying complexity (small-, medium-, and large-scale integration). A familiarity with vendor offerings and knowledge of data book specifications are emphasized; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

ELT 2010 Analog Electronics (4)**as required**

This course for General Engineering Technology majors introduces the use of diodes and transistors as basic circuit elements in power supplies, amplifiers, and digital gates. Operational amplifier configurations are examined in detail. Transfer functions, frequency response, and the effects of feedback are explored; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1102

ELT 2030 Digital Electronics II (4)**as required**

This is the second course in a sequence of digital electronics for students majoring in Telecommunication Technology. This course is designed to train students in the organization, architecture, and hardware aspects of digital computer systems. Topics include an introduction to microprocessors; types and characteristics of different chips; microprocessors architecture; introduction to programming; PC system organization; operating systems; motherboards; bus structures; memory; I/O interface devices; disc drives; video displays; and printers. Serial and parallel buses are discussed. Applications include the interfacing of peripherals, data communications between computers, and a team project; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1110

ELT 2040 Computer System Components/Interfaces (4)**spring**

This course is a continuation of the interfacing concepts started in ELT 2050 from the local processor level to the board and systems level. Topics studied include data communications standards and techniques; data structures; multiple interrupt problems; and advanced assembly language programming. Computer systems and peripherals are studied with emphasis on dealing with systems, reading documentation, and interconnecting subsystems. Software will be written to test the systems; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1080 and 2050 and CIS 2025 [Course fee: \$70]

ELT 2050 Microcomputer Techniques (4)**fall/spring**

This course introduces students to 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 laboratory per week. Prerequisite: ELT 1110, CIS 2025, and ELT 1080 or concurrent enrollment in ELT 2051 or 3030 [Course fee: \$150]

ELT 2051 Electronics I (4)**fall**

This is an introductory course in electronics. It extends DC-AC circuits into active devices and their associated circuitry. Stress is placed on solid-state theory. Diodes, bipolar transistors, and several types of field-effect transistors are studied. Small signal equivalent circuits and large signal graphical analysis are developed. Included in the applications studied are Class A and Class B amplifiers. Practical approximation methods are developed throughout the course; 3 hours of lecture, 3 hours laboratory per week. Prerequisite: ELT 1032 and MAT 1520

ELT 2052 Electronics II (4)**spring**

This course addresses electronics from a system and applications view rather than a device view as in ELT 2051. System issues such as two-port networks, frequency response, dB, bode plots, and related topics are explored. Active filters, linear supplies, switching supplies, oscillators, and modulation are also covered. Several additional topics that tie electronics and applications together are also introduced; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 2051, 2060 and MAT 1520

ELT 2060 Electronic Applications (4)**fall/spring**

The purpose of this course is to integrate material from several courses in order to achieve small working systems. In the process of achieving this integration, topics in the theory and application of operational amplifiers, the theory and applications of A/D and D/A systems, and the integration of instrumentation will be explored. Analysis in both time and frequency will be used. Additional topics will be added as appropriate. Analysis will often use MultiSim to assist with concepts; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1032, concurrent enrollment in ELT 2050 and 2051

ELT 2061 Electromechanical Systems I (4)**spring**

The course introduces applied system mathematics including block diagram algebra, LaPlace trans-

forms, and graphical technique such as Bode analysis. Basic modeling techniques for first and second order systems are covered. Open loop characteristics are initially developed and system models are then constructed for closed loop simulations. Damping coefficients and stability are looked at with an initial introduction to PID controllers. Some time is spent looking at a commercial Programmable Logic Controller; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520, ELT 1032 or 3060 and 1110 or 2072

ELT 2071 Basic Electricity (3) fall

The course introduces the physical concepts of electricity and electrical devices for mechanical engineering technology students. Fundamentals of power, resistance, inductance, capacitance, motors, and generators from the standpoint of their relationship to mechanical applications are covered; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1420

ELT 2072 Electronics (4) spring

Linear and digital electronics, including microprocessors, are studied from the standpoint of the electrical-mechanical interface. Concepts of sensors and transducers, amplifiers, semiconductor control devices, and integrated logic circuits account for approximately two-thirds of the course. The last third is spent on learning the application of a small microcomputer to simple industrial control problems. Related laboratory exercises reinforce the class material; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 2071 and CIS 1050 or MEC 1050 or equivalent

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 Programmable Logic Controllers. Applications and control issues involved with these devices are investigated as well. If time permits, additional topics of student interest will be investigated; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 2051 and 2060

ELT 2210 Introduction to Solid State Lighting (3) fall

This course introduces the fundamentals of solid state lighting systems. The student will gain experience using various LEDs, optics, and heat sinks to create a total lighting solution. Various applications for using LEDs for lighting will be studied; 2 hours of lecture, 2 hours of laboratory per week. Prerequisites: PHY 1041 or 2041 and MAT 1420 [Course fee: \$100]

ELT 2720 Electrical Project (3) 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 will work on a product of reasonable complexity; develop and assemble a printed circuit board; and document and present the finished product. The laboratory portion is intended to develop practical skills in circuit board layout and fabrication; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1052, 1110, 2050, and 2051, concurrent enrollment in ELT 2052 and 2130 [Course fee: \$150]

ELT 2730 Engineering Project (3) as required

The goal of the capstone course is to provide students with an opportunity to use their technical knowledge to develop a final technical project. Students need to use their abilities in analysis, synthesis, and interpersonal skills to solve engineering or manufacturing problems. The objectives of the course are for students to apply technical knowledge to solving problems; practice decision-making skills; demonstrate teamwork; perform technical analysis; demonstrate synthesis; develop documentation and presentation skills; and develop time management. The course is normally offered on-line; 3 hours of lecture/laboratory per week. Prerequisite: ELT 1051, 2050, and 2051

ELT 3010 Digital II (4) fall

This course is designed to extend the student's skill with digital hardware. It covers more advanced topics than can be covered in a first digital course, 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. The laboratory experi-

ences illustrate the various methods for design entry such as schematic entry and VHDL. Additionally, simulation and testing is a major focus in the laboratory. Designs are implemented using commercial Programmable Logic Devices (PLDs); 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1110,1080, 2050

ELT 3020 Electrical Circuits and Controls (4) fall

This course provides an intense introduction to the basics of DC and AC circuits. The applications of these principles to electromechanical systems, transformers, power distribution, and motors are explored. Transducers, sensors, and the fundamentals of digital systems are examined as well; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520 or junior standing and instructor permission

ELT 3030 Solid State Electronics (4) spring

This course reviews solid state theory and introduces students to multilayer semiconductor devices (diodes, bipolar and field effect transistors, thyristors, PUTs, etc.). Other topics include integrated circuit amplifiers, comparators, timers, regulators, multiplexers, and oscillators. Computer simulation software is used; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 1032 or 3060

ELT 3040 Electronic and Data Communications (4) spring

This course introduces students 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, 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, 3 hours of laboratory per week. Prerequisite: MAT 1520, ELT 2050, 3030, and CIS 2025

ELT 3050 Microprocessor Techniques II (4) spring

This third course in digital electronics focuses on implementing an embedded system. Topics include a review of programmable peripherals; interfacing standard i/o devices and sensors found in embedded systems; standard communication interfaces; battery-based operation; ROMable code; mixed language programming (assembly language and C); real time programming issues; and hardware based debugging techniques (in-circuit emulation). The students work with a single board computer and build a complete, stand-alone embedded system; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 2050, 3010

ELT 3053 Electronics III (4) fall

This course builds on the introduction to solid state devices and analog systems in Electronics I and II and will incorporate current devices and techniques in the industry. Topics will include additional discrete devices (voltage references, IGBTs), specialized amplifiers (instrumentation amplifiers, current sense amplifiers), and power management systems (smart battery charging circuits, high efficiency DC to DC/AC conversion). The specific devices and systems will change as suggested by the industry. Prerequisite: ELT 2052, 2060, and 2130

ELT 3060 Electrical Circuit Analyses (3) fall

This course reviews and extends the circuit analysis capabilities of students who have only had an introductory electrical circuits course. Topics include passive components (resistor, capacitor, inductor, transformers), Kirchhoff's laws, network theorems (mesh, nodal, Thevenin, Norton, superposition), dependent sources, two port models, and transient response. This course emphasizes alternating current concepts and makes use of computer simulation software; 3 hours of lecture per week. Prerequisite: MAT 1520 and ELT 2072 or 1031 [Course fee: \$175]

ELT 4010 Computer Architecture (3) fall

This course discusses the architecture of computer systems, both inside the CPU as well as outside. Topics include pipelines, cache, floating-point unit, RISC vs. CISC architecture, and so forth. Issues such as branch prediction, pipeline interlocks, and coordinating SMP machines are discussed. 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

Digital Signal Processing (DSP) theory and applications are covered from an introductory to an intermediate level. Throughout the course, the implementation of DSP algorithms and mathematical functions such as Infinite Impulse Response (IIR) filters, Finite Impulse Response (FIR) filters, correlation routines, Discrete Fourier Transforms (DFT), and Inverse Discrete Fourier Transforms (IDFT) are examined; 3 hours of lecture per week. Prerequisite: ELT 2050 and MAT 2532 [Course fee: \$25]

ELT 4040 Advanced Electronic Systems & Components (4) spring

This course builds on all the coursework in the EET program and explores specific topics which are currently relevant. Topics will include software and hardware aspects of advanced communications systems (such as Bluetooth, WiFi, or USB), electro-optical systems (sensors and displays), and (machine) vision systems. The specific devices and systems will change as suggested by industry; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: CIS 2260; ELM 3015; ELT 3040, 3050, and 3053; and MAT 3170

ELT 4701 Electrical Engineering 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. Students are given a small electromechanical design on which to apply the lecture material. Students also select and begin planning a major, team-oriented project that is completed in Projects II. The project must have major software, electrical, and mechanical components; 1 hour of lecture, 3 hours of laboratory per week. Prerequisite: CIS 2260; ELM 3015; ELT 2052, 2061, 3040, and 3050; PHY 3120, concurrent enrollment in ELM 4015 and 4231 [Course fee: \$150]

ELT 4702 Electrical Engineering Project II (3) spring

This course is a continuation of EET Project I 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 inform everyone of the team 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: ELT 4040, 4701, concurrent enrollment in ELM 4232 [Course fee: \$150]

Electromechanical Engineering (ELM)

ELM 3015 Sensors and Instrumentation (3) fall

This course is an introduction to 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 laboratory per week. Prerequisite: ELT 1110 or 2072, 2051, 2060 or equivalent, MAT 1520, PHY 1042, concurrent enrollment in CIS 2025, ELT 3060 or equivalent, MAT 2532 [Course fee: \$200]

ELM 4015 Electromechanical Power Systems (4) 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, 3 hours of laboratory per week. Prerequisite: ELM 3015, MAT 3170 [Course fee: \$25]

ELM 4231 Control Systems I (4) fall

Students are introduced to 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 the design of discrete-time controllers using z-transform methods; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELT 2061, MAT 3170, senior standing in

either the BS.EET or BS.ELM program, or instructor permission [Course fee: \$150]

ELM 4232 Control Systems II (4)

spring

This course is a continuation of Control Systems I. Students are introduced to complex second-order and higher-order systems. Topics include advanced system modeling methods, performance parameter design trade-offs, the design of higher-order controllers, and State-Space design methodology. Microcontroller-based controller design is emphasized; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: ELM 4231 [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. Students are given a small electromechanical design on which to apply the lecture material. Students also select and begin planning a major, team-oriented project that is completed in Projects II. The project must have major software, electrical, and mechanical components; 1 hour of lecture, 3 hours of laboratory per week. Prerequisite: CIS 2025; ELM 3015; ELT 2050, 2061, and 1032 or 3060 and 2052 or 3030; MEC 1011, 2010, 2035, 2065, 3020 or equivalent; PHY 3120; concurrent enrollment in ELM 4015, 4231 [Course fee: \$150]

ELM 4702 Electromechanical Project II (3)

spring

This course is a continuation of ELM Project I 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 inform everyone of the team 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 and concurrent enrollment in ELM 4232, ELT 3040 [Course fee: \$150]

English (ENG)

ENG 1042 Introduction to College English (3)

fall/spring

Students develop reading and analytical skills by reading samples of student and professional writing. They develop their writing skills by preparing at least four essays using a variety of rhetorical strategies and completing additional grammar and composition exercises. Drafting and editing are emphasized in the weekly labs. This course is writing-intensive; 3 hours of lecture, 1 hour of laboratory per week. Prerequisite: Placement level 1

ENG 1060 Freshman Composition (3)

fall/spring

This course teaches the same writing concepts as ENG 1042. Successful completion of this course prepares students for ENG 2080. All students are introduced to composing on the word processor and the use of rhetorical strategies. They complete a variety of writing exercises, essays, a research paper, and an optional oral presentation. The Writing Graduation Standard is assessed in this course. This course is writing-intensive; 3 hours of lecture, 1 hour of laboratory per week. Prerequisite: Placement level 2 or higher

ENG 1061 English Composition (3)

fall

Students are expected to read and think critically, to write effectively, and to understand 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 is assessed in this course. This course is writing-intensive; 3 hours of lecture per week. Prerequisite: Placement level 3 or higher

ENG 1070 Effective Speaking (3)

fall/spring

Students study various theories of effective oral communication with the focus on public speaking. Students develop their abilities to listen, analyze audiences, and use visual aids. For some majors, the Oral Communication Graduation Standard is assessed in this course; consult with your advisor about your major; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

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 technical reports, proposals, instructions, graphic aids, and correspondence. Students are prepared for employment interviews through their study of principles of oral communication and their writing of job application letters and resumes. A major technical report written on a topic in the student's area of interest is required. The Writing Graduation Standard is assessed in this course. This course is writing-intensive; 3 hours of lecture per week. Prerequisite: ENG 1061 or equivalent

ENG 2101 Introduction to Creative Writing (3) as required

This course encourages students to explore themselves and the world around them with a writer's eye. Along with writing their own stories, students will read stories and essays by other writers and will workshop each other's stories. This course is writing-intensive; 3 hours of lecture per week. (General Education: AH) Prerequisite: ENG 1061 or equivalent

ENG 2105 Creative Nonfiction (3) as required

The course is an introduction to fundamental techniques of writing creative nonfiction, including examining point of view and use of time, place, details, and language. Students refine their writing skills through attention to the craft of writing, revision, and the reading of models. This course is writing-intensive. (General Education: AH) 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 students to study published poetry, the emphasis will be on writing poetry for an audience of poetry readers. The course will also cover the rudiments of narrative structure. No previous writing experience is required. (General Education: AH) Prerequisite: ENG 1052, 1060, 1061, or permission

ENG 2320 Themes in American Literature (3) as required

Students read and discuss 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 will enhance the students' reading experience; 3 hours of lecture per week. (General Education: AH) Prerequisite: ENG 1061 or equivalent

ENG 2485 Literature of Peace and Pacifism (3) as required

This course introduces students to the themes of peace, pacifism, and nonviolence in literature from the United States and around the world. Students will read and discuss classic and contemporary novels, short stories, poems, and films that respond critically to war and suggest peaceful alternatives; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

ENG 3125 Science Fiction Literature (3) as required

3 hours of lecture per week. (General Education: AH) Prerequisite: Junior standing

ENG 3485 The Tradition of Anti-War Literature (3) as required

This course studies, in depth, the tradition of anti-war literature from the United States and around the world. We will read and discuss 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. (General Education: AH) Prerequisite: ENG 1061 or equivalent

ENG 3490 Memoir: Telling Your Life Story (3) as required

The purpose of this course is to teach students to discover the natural form and content of their life stories from a writer's perspective. First, students will practice the four steps of the writer's craft: observation, expression, reflection, and wordsmithing. Second, they will read memoir excerpts from classical and contemporary writers, studying different styles and forms of storytelling. Third, students will workshop each others' stories, practicing the necessary art of revision, which is the most essential and

often the most difficult part of creative writing. Lastly, students will have the opportunity to perform their stories in a public reading; publishing in print and electronic media will also be covered. This class is writing-intensive; 3 hours of lecture per week. Prerequisite: Junior standing or instructor permission

ENG 3590 The Films and Novels of Stephen King (3) as required

This advanced writing course is designed to offer a critical inquiry into the films, novels, life and works of one of the bestselling and most popular authors 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* (among others), students will explore their personal relationship to horror fiction while entertaining a central, pivotal question: What does horror's 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. (General Education: AH) Prerequisite: ENG 1061 or junior standing

ENG 3710 Science Fiction Literature: Utopias, Dystopias, & Ecotopias (3) as required

This course introduces students to utopian, dystopian, and ecotopian visions in science fiction literature. We will read and discuss novels, short stories, and films, addressing the theme of sustainable futures or apocalypse; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

English for Speakers of Other Languages (ESL)

ESL 0141 Basic College English Skills (4) summer

This integrated course helps non-native English speaking students at the intermediate and high intermediate level to develop their skills in grammar, writing, reading, listening, and speaking. These basic academic skills are taught, practiced, and tested in the classroom, the writing laboratory, and the language laboratory, which has ESOL software. Students develop academic writing skills through weekly assignments. Reading comprehension and vocabulary skills are taught through analysis of general and technical reading selections. Students must achieve at least a "B" and demonstrate improved skills on post-course placement tests in order to take ENG 1060. This course is writing-intensive; 2 hours of lecture, 2 hours of language laboratory, 2 hours of writing laboratory per week. Placement assessment of intermediate to high intermediate level of English and the Vermont Tech writing placement test are required to determine placement level. Credits do not count toward graduation.

Environmental Studies (ENV)

ENV 2070 Environmental Law (3) as required

This course will analyze various aspects of environmental policy-making in both the U.S. and internationally. It will begin with various philosophical and ideological perspectives concerning the relationship between man and nature. There will be consideration of how environmental issues interact with various other types of societal goals, particularly economic prosperity, security, and freedom. The class will study aspects of the environmental policy process and its outcomes in the U.S. through the use of a number of case studies relevant to particular policy problems (including air and water pollution, biological engineering, and energy); 3 hours of lecture per week. (General Ed: SS) Prerequisite: None

ENV 3050 Studies in Environmental Issues (3) as required

Technological advances have been used to lessen or solve many of humanity's problems. In one major area, the environment, advances in technology have not always accomplished the desired ends. This course looks at basic environmental science and uses political, economic, and sociological perspectives to look at environmental problems, proposed solutions, and the failure of society to implement effective solutions; 3 hours of lecture per week. (General Education: SS) Prerequisite: Advanced standing or instructor permission

Equine Studies (EQS)

EQS 1011/1012 Introduction to Equine Studies (2/2) fall/spring

This course introduces students to Vermont Tech and provides an overview of the Equine Studies major. Topics to be covered include an examination of 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. Prerequisite: EQS 1012 requires EQS 1011

EQS 1031 Stable Management I (2) **fall**

Students will be introduced to stable management principles and will combine theory and practice by providing daily horse care and stable maintenance as needed under the supervision of the instructor and the Equine Center Supervisor. Topics include regular health assessment, first aid, bandaging, use of restraints, safe handling practices, deworming schedules, clipping, and basic hoof care; 1 hour discussion, 2 hours laboratory per week. Prerequisite: None

EQS 1032 Stable Management II (2) **spring**

Students will build upon their study of stable management principles from EQS 1031 and will continue to be responsible for daily horse care under the supervision of the Equine Center Supervisor. Topics include insurance; contracts; facilities; arena footing; fencing and pasture management and rotation; basic feeding principles; fire safety; manure management; and trailering; 1 hour discussion, 2 hours laboratory per week. Prerequisite: None

EQS 1220 Horse Judging (1) **fall**

This course provides an introduction to the theory and practice of horse and horse show judging, with the goal that students will participate on the Vermont Tech horse judging team and/or pursue certifications in judging; 3.5 hours once per month during the term. Prerequisite: None

EQS 2011 Equine Training I (3) **fall**

Students learn safe and effective techniques for training the green or unbroken horse for various disciplines, as well as develop skills to critically analyze various trainers and strategies. The course includes discussion sessions during which students view and evaluate professional trainers. The labs include hands-on practice of 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 will be introduced to harness and/or saddle as well as desensitization training. Introduction to actual riding or driving will depend on each training horse's rate of progress; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: Two semesters of EQS 2025 [Course fee: \$150]

EQS 2020 Farrier Care & Lameness (2) **fall**

This course is designed to teach students to recognize anatomical issues with a horse's hoof and leg structure and to evaluate the care provided by a farrier. They will learn how to do a basic hoof trim and to provide emergency care until the farrier can arrive; 1 hour of lecture, 2 hours of laboratory per week. Prerequisite: Two semesters of EQS 2025, EQS 1032 or instructor permission [Course fee: \$150]

EQS 2025 Equitation (1) **fall/spring**

Emphasis in each course is placed on assisting each student's development at his/her pace and introducing all students to a variety of riding and driving methods. Students will continue to learn 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 will be covered in each course, but all topics will be addressed within the sequence, which every student must complete in the correct order. Note: all students are encouraged to take at least one semester of dressage, driving, and western horsemanship; 2 hours of riding lessons per week; graded Pass/No Pass. Prerequisite: Department placement or permission of the instructor. This course is repeatable for credit. [Course fee: \$500]

EQS 2041 Equine Massage I (3) **fall**

This course provides an introduction to the theory of equine massage. It includes intensive study of equine anatomy, including muscular and skeletal structures. 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 laboratory per week. Prerequisite: VET 1020

EQS 2801/2802 Summer Internship/Internship Review (0/1) **summer/fall**

Students may participate in summer equine internship of their choosing and will coordinate with the

program director about the terms of the internship, including number of hours and responsibilities included. Students will keep a daily record of hours and activities. In addition to completing the required documents, there is a 45 hour minimum requirement. The student will take part in an internship review the subsequent fall term, at which point credit will be awarded and a fee will be assessed; graded Pass/No Pass. Prerequisite: Permission [Course fee: \$250]

EQS 3012 Equine Training II (3)

spring

This course focuses on refining the green-broke and the trained horse. Attention will be 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 laboratory per week. Prerequisite: EQS 2011 with a C or better [Course fee: \$150]

EQS 3031 Riding Instruction I (3)

fall

Riding Instruction I will expose students to the standards of three equitation seats: Dressage, Western, and Hunt Seat. Students will participate 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 laboratory per week. Prerequisite: Three semesters of EQS 2025 or permission of the instructor

EQS 3032 Riding Instruction II (3)

spring

Students will focus on the processes of learning and teaching, the way in which people process information, and the elements necessary for excellent instruction. The course incorporates knowledge of human and equine biomechanics from EQS 3031 with understanding and using communication skills; evaluating and working with different learning modalities; and analysis, organization, and planning of lessons; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: EQS 3031 or permission of instructor

EQS 3042 Equine Massage II (3)

fall

This course continues to build upon the foundations established in Equine Massage I, 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. Laboratory sessions will provide students with the increasing responsibility for determining areas of concern, developing plans for improvement, and implementing and assessing such measures; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: EQS 2041

EQS 4010 Law and the Equine Professional (3)

fall

Students in this course will review equine-specific legal cases and learn about structure, risk, liabilities, and other pertinent topics necessary to running a successful equine-related business. The course will include in-depth examination of differences, advantages, and disadvantages of different structures for equine businesses; equine liability laws; insurance issues; and equine contracts; 3 hours of lecture per week. Prerequisite: None

EQS 4110 Equine Health and Diseases (3 or 4)

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; preventative and maintenance care measures; and emergency care for horses; 2-3 hours of lecture per week, 2 hours of lab as required. Prerequisite: AGR 2030 and VET 1020

EQS 4120 Therapeutic Programs (2)

spring

This course provides the historical and social context of the ever-increasing popularity of therapeutic riding and driving programs. Students will learn about how such programs are operated, the clientele they serve, and the crucial role that therapy horses play in peoples' lives. There will be opportunities to meet individuals involved with such programs and to visit an operational equine therapy program; 2 hours of lecture per week. Prerequisite: None

EQS 4610 Equine Studies Senior Seminar (3)

spring

Under the joint supervision of the instructor (and a mentor when necessary), students will propose, gain approval for, and complete a research project on a specific area of the equine industry. The project will include a hands-on component (unless an exception is granted by the instructor) and will conclude with

a substantive written report and an oral presentation. Classes will include employment search strategies, guest speakers from various areas of the equine industry, and discussions of current issues within the industry; 3 hours of lecture per week. Prerequisite: None

Fire Science (FSC)

FSC 1010 Principles of Building Construction and Fire Protection (3) fall

This course provides the components of building construction that relate to fire and life safety and how understanding the building types and construction principles will improve 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. Prerequisite: None

FSC 1021 Firefighting Services I (3) fall

This introductory course provides an overview of fire services; career opportunities in fire fighting 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. Students will learn basic fire suppression, rescue, and extrication skills. This academic course will include 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; 3 hours of lecture per week, some weekend training required. Prerequisite: None (Non-credit version is CED 0012) [Course fee: \$20]

FSC 1022 Firefighting Services II (4) spring

Firefighting Services II 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. Students will learn and practice basic fire suppression, rescue, and extrication skills. Upon successful completion of this course students will be 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; 4 hours of lecture per week, some weekend training required. Prerequisite: FSC 1021 (Non-credit version is CED 0013)

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 will include 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. Prerequisite: None

FSC 1122 Independent Study (3) as required

Students will have the opportunity to pursue an independent or public research project and participate in a service-learning project such as fire education. Students will be required to submit a thesis for their project which outlines the topic, research methods, and evaluation method. Prerequisite: Departmental permission

FSC 1210 Fire Inspector I (3) spring

The Fire Inspector I course is designed as an introductory course to educate the student in the principles and techniques of fire prevention, life safety inspection, and code compliance. It conforms to National Fire Protection Association 1031: Standard for Professional Qualifications for Fire Inspector I and Plan Examiner. Built as a beginning course to certification, the course will include case studies, field inspection exercises, and report writing; 3 hours of lecture per week. Prerequisite: None

FSC 1220 Fire Service Leadership (3) spring

This course is designed to develop a foundation of leadership skills for the firefighter/officer. Course content will include the identification of leadership styles, group dynamics, diversity, conflict resolution, managing change, and problem solving. This course will emphasize personal leadership development and supervisory skills using applied research, readings, group exercises, and classroom discussion; 3 hours of lecture per week. Prerequisite: None

FSC 2020 Fire Service Hydraulics and Water Supply (3) fall

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 2030 Firefighter Occupational Health and Safety (3) as required

Students learn the basic concepts of occupational health and safety as it relates to emergency service organizations. Topics include risk evaluation and control procedures for fire stations, training sites, emergency vehicles, and emergency situations involving fire, EMS, hazardous materials, and technical rescue. Upon completion of this course, students should be able to establish and manage a safety program in an emergency service organization; 3 hours of lecture per week. Prerequisite: Departmental permission

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 will be viewed from the perspective of the chief officer. Classroom content will include grant writing; extensive budget development and a budget presentation project; public presentation skills; and analysis of the fire department as a business in today's world; 3 hours of lecture per week. Prerequisite: None

FSC 2220 Firefighting Strategy and Tactics (3) spring

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. Students will make and document 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: None, permission required for non-FSC majors

FSC 2230 Hazardous Materials Chemistry and Operations (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 students to determine an initial course of action for emergency responders and understand strategies, tactics, and resource management techniques for handling hazardous materials incidents. Upon successful completion of this course and supplemental field and classroom training; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: CHE 1020

FSC 2240 Fire Protection Systems (3) spring

This course provides information relating to the features of design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, and water supply for fire protection and portable fire extinguishers. Classroom activities will provide students with the opportunity to use fire extinguishers, inspect wet/dry/residential sprinkler systems, and study various alarm notification systems; 3 hours of lecture per week. Prerequisite: None

FSC 2250 Fire and Life Safety Educator (3) fall

This course provides fundamental information regarding 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. Students will prepare presentations, conduct a safety day community program, and study the effects of tragic fires which led to new fire safety standards; 3 hours of lecture per week. Prerequisite: None

FSC 2820 Residential/Internship Program (3) as required

This course is designed to provide the student with actual experience as a firefighter in a municipal fire station or an internship experience in private industry involved with fire prevention, loss control, or risk management. In the residential program, the student will perform actual firefighter duties which include station duties; fire safety instruction; fire suppression activities; responding to alarms, fire calls, motor vehicle accidents, mutual aid, and good intent calls; and special hazards incidents. Upon place-

ment in the internship program either in private industry or fire-related service, a student will participate in prevention or risk management activities under the supervision of a supervisor or manager. Prerequisite: Vermont certification as a Firefighter I and EMT-B, departmental permission

Geography (GEO)

GEO 1010 World Geography (3)

as required

This course introduces students to the fundamental concepts of geography and the major geographic regions of the world. The course examines the ecological interactions between the physical and the human environment. Following an introduction to the basic terms and concepts of geography, the course continues to explore each of ten regions of the globe; 3 hours of lecture week. (General Education: SS) Prerequisite: None

Graduation Standard (GRS)

GRS 0222 Information Literacy (0)

fall/spring

This is an online tutorial and test used to meet the graduation standard requirement for information literacy. Students should complete the information literacy standard in their first year within a degree program. In order to complete the standard, students enrolled in GRS 0222 go online and complete the tutorial, then complete the online test. The tutorial and test may be repeated. To pass at the associate level, students must achieve a score of 20 to 24; to pass at the bachelor's level, students must achieve a 25 or better.

History (HIS)

HIS 1111 World History I (3)

as required

This course serves as an introduction to world civilizations: Mediterranean, European, Asian, American, and African. Study includes origins of the time of global expansion of civilizations; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

HIS 1112 World History II (3)

as required

This course serves as an introduction to world civilizations from 1500 through the present: European, Asian, African, and American. Study includes origins of the time of global expansion of civilizations and the modern evolution of world powers and world problems; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

HIS 1211 American History I (3)

as required

In the course, students survey major historical events as they affected the lives of the American people. Emphasis in the course is placed on the changes in institutions, values, and lifestyles that characterized the evolution of our society from a colonial, agrarian culture to that of a unified, democratic republic; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

HIS 1212 American History II (3)

as required

Students examine the historical roots of American society as an urbanized, technological culture and consider the problems and solutions generated by such a culture. Students also study the evolution of the US in foreign affairs to its present status; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

HIS 1220 Native American Histories and Culture (3)

as required

This is an interdisciplinary course exploring indigenous cultures of North America. Students will consider 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. (General Education: SS) Prerequisite: None

HIS 1260 Information Technology: Past, Present, and 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 tech-

nologies; 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. (General Education: SS [for non-computer majors]) Prerequisite: None

HIS 2070 Vermont History (3)

as required

This course surveys the history of Vermont from early days to the present. Students explore economic, political, social, and cultural themes with a focus on what makes this region unique; 3 hours of lecture per week. Prerequisite: None

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, students will study 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, students will learn of the continuation of the environmental, women's, and civil rights movements. (General Education: SS) Prerequisite: None

HIS 2270 Society and 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. The course will consider social and cultural adaptation to environmental conditions and challenges and will analyze the relationship and interaction between society and environment in the development of sustainable communities. (General Education: SS) Prerequisite: None

HIS 2660 European Classroom (3)

fall

This course will immerse students in the art, history, and architecture of a foreign city through participation in intensive coursework combined with the experience of a guided travel tour to Europe. The course will use visual perception and critical analysis to study the interconnected fields while expanding student learning by facilitating experience of works of art and architecture first hand. It will reinforce each student's understanding of topics in the history, culture, art, and architecture of the target city. This is a cultural experience intended to enrich and broaden student perspectives in our increasingly global world; 3 hours of lecture per week. (General Education: SS) Prerequisite: ENG 1061 and instructor permission [Course fee: TBA]

HIS 3165 Vermont History and Government (3)

as required

This course 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: None

Humanities (HUM)

HUM 2020 Bioethics (3)

as required

This course provides an exploration of ethical issues from beginning-of-life to end-of-life, from legal, medical, and philosophical perspectives. Topics include assisted reproduction; abortion; euthanasia; genetic experimentation and cloning; and homosexuality; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2040 The Holocaust (3) as required

Students in this course will examine the Holocaust thematically through a variety of media: psychology, history, literature, and sociology; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2060 Cyberethics (3) as required

This course introduces students to the fundamentals of ethical inquiry and the ethical implications of developments in computer technology; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2070 The Vampire in Literature, Culture, and 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, students will understand the fundamental aspects of Gothic literature and formulate their own ideas as to the importance of the vampire archetype. In addition, students will learn to identify vampirical elements in literature and film and will enhance their knowledge and understanding of the vampire's role in popular culture. This class is writing-intensive; 3 hours of lecture per week. (General Education: AH) Prerequisite: ENG 1061 or equivalent

HUM 2080 The Literature and Culture of Witchcraft (3) as required

Grounded in the early European historical context of Witchcraft and the Colonial American experience of Witchcraft, this course engages students 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, students will develop their own unique discourse in regards 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. (General Education: AH) Prerequisite: ENG 1061 or equivalent

HUM 2160 Humor in Literature, Film, & Writing (3) as required

In this rhetoric course, students first examine how humor works in literature and film and then use these tools in their own creative writing. The art of writing with style and of perfecting one's singular voice for various humorous purposes (including social, political, and persuasive) is taught through critical analysis of successful comedic literature and film, everything from *Lysistrata* to Annie Hall. Students will mix rhetorical strategies learned in their composition classes with comedic devices by writing stories, rants, parodies, reviews, and dramatic dialogue. Culminating projects will 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. (General Education: AH) Prerequisite: Successful completion of the freshman college English sequence or instructor permission

HUM 2170 The Culture of Sustainability (3) as required

This course introduces students to the culture of sustainability. We will read and discuss the literature and philosophy of sustainability, simplicity, and deep ecology and consider more mindful approaches to sustainability in our own lives; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2330 Peace Studies (3) as required

This course introduces students to the ideas, principles, and practices of peacemaking. We will examine the literature and philosophy of peace and nonviolence in the context of historical experience and learn practical ways of peacemaking through the practice of mindfulness. (Students may not receive credit toward graduation for both HUM 2330 and 3330); 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2350 Mindfulness, Meditation, Stress Reduction (3) as required

This course introduces students to the principles and practices of mindfulness, meditation, and mindful-

ness-based stress reduction. We will examine the literature and philosophy of mindfulness watch films, and practice meditation and stress-reduction techniques. This course is writing-intensive; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 2660 European Classroom (3) as required

This course will immerse students in the literature, art, and architecture of a foreign city through participation in intensive coursework combined with a guided travel tour to Europe. The course will use visual perception and critical analysis to study the interconnected fields while expanding student learning by experiencing the works of art and architecture first hand. It will reinforce each student's understanding of topics in the history, culture, art, and architecture of the country being studied. This is a cultural experience intended to enrich and broaden student perspectives in our increasingly global world. Prerequisite: ENG 1061 and instructor permission [Course fee: TBA]

HUM 3025 Myth: The Ties That Blend & Bind (3) as required

This course encourages students to explore a variety of myths from ancient cultures with special attention to their influence on and reflection of social beliefs and structures. Additionally, 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. (General Education: AH) Prerequisite: Junior standing or instructor permission

HUM 3050 Theories of Science and 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 lecture per week. (General Education: AH) Prerequisite: Junior standing or instructor permission

HUM 3070 The Vampire in Literature, Culture, & Film - Upper Level (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, students will understand the fundamental aspects of Gothic literature and formulate their own ideas as to the importance of the vampire archetype. In addition, students will learn to identify vampirical elements in literature and film and will enhance their knowledge and understanding of the vampire's role in popular culture. This class is writing-intensive; 3 hours of lecture per week. (General Education: AH) Prerequisite: Junior standing or instructor permission

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, students will gain 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 students in the living history of New England and is writing-intensive; 3 hours of lecture per week. Prerequisite: ENG 1061 or equivalent

HUM 3330 Peace Studies and Peacemaking (3) as required

This course studies the ideas, principles, and practices of peacemaking in depth. We will examine the literature and philosophy of peace, pacifism, and nonviolence in the context of historical experience and learn practical ways of peacemaking through mindfulness, nonviolent communication, and nonviolent conflict resolution. (Students may not receive credit toward graduation for both HUM 2330 and 3330); 3 hours of lecture per week. (General Education: AH) Prerequisite: None

HUM 3490 Crime and Punishment in Film and Literature (3) as required

This course introduces students 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 punish-

ment. Students discuss literature and films in the context of the humanities; 3 hours of lecture per week. (General Education: AH) Prerequisite: Junior standing or instructor permission

Interdisciplinary (INT)

INT 0010 Effective Learning (2)

fall/spring

This course will introduce students to the behaviors and skills necessary for academic success. Through a series of readings, journals, lectures, and essays, students will develop skills in setting goals; developing a sense of personal ownership and responsibility, and self-awareness, along with the more mechanical skills of note-taking and organization. Particularly appropriate for students on academic probation, the learning acquired will enable them to achieve and maintain good academic standing. Credits do not count toward graduation; 2 hours of lecture per week. Prerequisite: None

INT 1000 Freshman Orientation (1)

fall/spring

This course is designed to facilitate a successful transition to college and focuses on orientation to college, academic success strategies, professional development, and an introduction to a degree program. Topics include student rights and responsibilities; student grading and graduation requirements; student information technologies and data base orientation; campus/site resources; time management; note taking; introduction to career opportunities; and program specific topics; 1 hour of seminar per week; graded Pass/No Pass. Prerequisite: None

INT 3060 Leadership Studies (3)

as required

Leadership Development Studies curriculum delivers a diverse, interdisciplinary approach to leadership instruction. Grounded in the humanities, the curriculum is relevant to all in this 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 your leadership qualities; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

Landscape (LAH)

LAH 1020 Introduction to Horticulture (3)

fall

This survey course introduces the principles and practical applications of horticulture. Students become familiar with the basic science that forms the foundation of horticulture and use 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. Prerequisite: None

LAH 1021 Landscape Graphics (3)

fall

The purpose of this course is to familiarize students with a broad range of graphic techniques as well as the specific tools necessary for each. Specific coursework includes an introduction to drafting; conventions of landscape and architectural drawing (including their intentions, capabilities, and use); three dimensional drawing techniques; tonal value and texture rendition; various media and their specific uses; lettering; and color rendering for presentations; 6 hours of studio per week. Prerequisite: None [Course fee: \$20]

LAH 1030 Woody Ornamentals (3)

fall

This course covers the identification of approximately 100-130 native and cultivated woody plants found in northern New England. In addition, plant characteristics, landscape use, cultural requirements, and plant associations are explored. Emphasis is placed upon both plant identification and the plant selection process. Drawing as part of learning is encouraged; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

LAH 1040 Greenhouse Management (4)

spring

This course covers the fundamentals of commercial greenhouse production. Control of the greenhouse environment and the effects this has on plant growth are stressed. Students learn about greenhouse

construction, heating/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; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

LAH 1050 Introduction to Soils (4)

spring

Subject areas covered include soil formation and classification and the ways in which chemical, physical, and biological properties of soil affect plant growth. The course also deals with problems of soil drainage and the tillage methods best suited to erosion control. Students learn about soil testing and the most effective liming and fertilizing practices for economical crop production. The college and home farms are used in soil and fertilizer problem solving; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

LAH 2010 Landscape Construction Practices (3)

fall

This course introduces students to the materials and methods of landscape construction and management. Emphasis is placed on how general design 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 and 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 2011 [Course fee: \$20]

LAH 2011 Introduction to Landscape Design (3)

spring

The goal of this course is to introduce students to the basic principles of landscape design in order to build a fundamental knowledge of, and fluency in, the issues and language of 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, students receive an overview of landscape architectural history and are exposed to the work of practitioners in the field; 6 hours of studio per week. Prerequisite: LAH 1021, ARC 1210, or CPM 1021 [Course fee: \$20]

LAH 2012 Advanced Landscape Design (3)

spring

This course explores two essential aspects of landscape design: the art of site analysis and planning and the art of appropriate plant and materials selection in support of a design idea. During the course of the semester, students work on a "real world" project where they are asked to complete a thorough site analysis in preparation for the development of a working master plan. Students then develop a detailed planting and construction plan; and develop a cost estimate for the client. Throughout the semester, design composition and emphasis are stressed, as are oral and graphic presentation skills. Individual design projects are developed under faculty supervision and presented to a jury of faculty and distinguished practitioners; 2 hours of lecture, 3 hours of studio per week. Prerequisite: LAH 2011 [Course fee: \$20]

LAH 2020 Plant Propagation (3)

fall

Students in this course study the principles that explain and control plant propagation, as well as practice plant propagation techniques in the laboratory. Propagation by seeds, cuttings, grafting, layering, and other common methods is explored. Special emphasis is placed on the newest techniques in plant tissue culture; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: LAH 1020 [Course fee: \$10]

LAH 2030 Herbaceous Plant Materials (3)

fall

The primary objective of this course is to familiarize students with approximately 100 to 150 native and introduced herbaceous plants including perennials, annuals, biennials, bulbs, and turf grass. Emphasis is placed upon identification; aesthetic and functional uses in the landscape; plant culture and maintenance; transplanting; and planting design and composition; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

LAH 2720 Landscape Design/Sustainable Horticulture Seminar (2) spring

This course is designed with a two-fold purpose: to assist all Landscape Design & Sustainable Horticulture students in developing the attitudes and skills essential for career success and to act as a capstone course with a focus on the many possibilities within the broad field of horticulture and design. As such, it concentrates on the following critical areas: researching the job market and targeting the specific discipline area within the horticulture/design field the student is interested in pursuing; researching the various options with that targeted field; writing a resume and cover letter; and preparing either a portfolio, business plan, or some other significant project that demonstrates the student's readiness to seek employment. In addition, students are introduced to a broad spectrum of practicing professionals from all walks of the landscape design and horticultural fields, which also allows for opportunities for discussion of employment possibilities. This course is designed to develop attitudes and skills essential for career success; 1 hour of seminar, 2 hours of laboratory per week. Prerequisite: Sophomore standing

LAH 2801/2802 Summer Internship/Internship Review (0/1) summer/fall

After successful completion of the first year core curriculum, students are required to experience horticulture or design in an employment setting. With the aid of program faculty and staff, students will arrange a summer job/practicum that will broaden their understanding of real world horticulture and design. Prerequisite: Completion of the freshman year or instructor permission

Languages

ITA 1011 Italian I (3) as required

This course is designed for students with little or no previous knowledge of Italian. At the end, students will be able to ask and answer simple questions, to use several verb tenses, and to understand conversations necessary to being a tourist in Italy. As part of the Humanities requirement, students will also read from Dante's *L'Inferno*, and, through it, learn about Italy's art, culture, history, and geography. Assignments include biweekly journals as well as a 1,500-word research paper on *L'Inferno*, three quizzes, and two hour-long exams on the language; 3 hours of lecture per week. Prerequisite: None

SLS 1011 American Sign Language I fall

This course provides instruction in elementary communication with deaf and hard-of-hearing individuals. It emphasizes basic aspects of American Sign Language and attention is also given to deaf culture as well as issues and concerns of the deaf community; 3 hours of lecture per week. Prerequisite: None

SLS 1012 American Sign Language II as required

This course builds on students' basic knowledge of sign language. Emphasis on improving clarity, speed, fluency, and increasing expressive and receptive proficiency. Prerequisite: SLS 1011 or equivalent

SPA 1011 Spanish I (3) as required

This is the first course in a two course sequence and includes systematic introduction to the Spanish language and development of aural comprehension, speaking, reading, and writing skills. The course also provides an introduction to the cultures of Latin America and Spain; 3 hours of lecture per week, laboratory may be required. Prerequisite: None

Mathematics (MAT)

Students who have shown exceptional mathematical ability may be placed into calculus as their initial mathematics course at Vermont Tech. If this course is completed successfully, then prior requisite courses for calculus will be waived.

MAT 0200 Pre-Tech Mathematics (4) as required

This course prepares students for entry-level college mathematics courses. Credits do not count toward graduation. Prerequisite: Placement level 0 or 1

MAT 1040 Mathematics for Allied Health (2) spring

This course gives an introduction to basic concepts in general mathematics; 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 1100 Mathematics for Technology (3) fall

This course provides an introduction to technical mathematics for students in the automotive, construction, and diesel programs. It is designed for students whose academic background includes only an introduction to algebra and geometry. Topics covered include a review of arithmetic; percentages; dimensional analysis; scientific notation; sign numbers; order of operations; basic algebra (including exponents, radicals, factoring, algebraic fractions); ratio and proportions; systems of equations (2 x 2 only); graphing of equations; formulas; linear and quadratic equations; vectors; geometry; radians right triangle trigonometry; and the law of sines and cosines; 3 hours of lecture per week. Prerequisite: Placement level 2 or MAT 1210

MAT 1111 Introduction to Technical Mathematics I (5) fall

This course is the first of a two course sequence giving an introduction to technical mathematics. It will provide the skills necessary to be successful in technical mathematics. It is designed for students who have taken two years of high school algebra who do not place into MAT 1420. Topics covered include fundamental algebraic concepts; geometry; right triangle trigonometry; factoring and algebraic functions; systems of equations; quadratic equations; radicals; and exponents. Credit is not awarded for both MAT 1420 and MAT 1111 toward graduation; 5 hours of lecture per week. Prerequisite: Placement level 3

MAT 1112 Introduction to Technical Mathematics II (5) fall

This course is the second of a two semester sequence giving an introduction to technical mathematics. It will provide the skills necessary to be successful in technical mathematics. Topics covered include a review of factoring and algebraic functions; exponents and radicals; exponentials and logarithms; trigonometric functions of any sized angle; oblique triangles and vectors; graphing trigonometric functions; trigonometric identities; and complex numbers. Credit is not awarded for both Mat 1420 and MAT 1112 toward graduation; 5 hours of lecture per week. Prerequisite: MAT 1111 with a C or better

MAT 1210 Principles of Mathematics (3) fall/spring

This course is a review of general mathematics principles and an introduction of concepts for the solution of agricultural, agribusiness, and business problems. Topics covered include pocket calculator use; basic algebraic operations; solution of linear and quadratic equations; geometry concepts of line, area, and volume; variation; trigonometry of right triangle; 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 use of 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 math of finance; 3 hours of lecture per week. Prerequisite: Placement level 3

MAT 1340 Algebra and Trigonometry (5) spring/summer

This course is a one semester course covering the necessary topics in algebra and trigonometry that will provide the skills necessary to be successful in technical mathematics. It covers the topics of both MAT 1111 and MAT 1112 in one semester and is designed to be a bridge course for students who have completed a lower level math or who are off-sequence and have not placed into MAT 1420. Credit is not awarded for both MAT 1420 and MAT 1340 toward graduation; 5 hours of lecture per week. Prerequisite: Placement level 3 or MAT 1221 or a grade of C or better in MAT 1100 or 1210

Course may be taken by DVD with departmental permission [Course fee: \$20]

MAT 1420 Technical Mathematics (5) fall/spring/summer

This course stresses the relation of mathematics to engineering applications and development of an appreciation of 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 and complex numbers; trigonometric identities and equations; and graphs of trigonometric functions; 5 hours of lecture per week. Prerequisite: Placement level 4 or a C or better in MAT 1112 or 1340

Course may be taken by DVD with departmental permission [Course fee: \$20]

MAT 1520 Calculus for Engineering (4) **fall/spring**

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 rate; and applications of the integral to include area and volume; 4 hours of lecture per week. Prerequisite: Placement level 5 or MAT 1420
Course may be taken by DVD with departmental permission [Course fee: \$20]

MAT 2021 Statistics (3) **spring**

This course is an introduction to the basic ideas and techniques of probability and statistics. It is designed to prepare students to interpret quantitative information and to make statistical decisions. Topics include descriptive statistics; probability; characteristics of the normal distribution; mean and standard deviation; and steps in hypothesis testing; 3 hours of lecture per week. Prerequisite: MAT 1100, 1210, 1221, and 1420 or Placement level 3

MAT 2120 Discrete Structures (3) **fall/spring**

This course introduces discrete structure in computer science. The instruction covers such topics as sets, set logic, relations, functions, proof techniques, induction, logic, graphical representations, and algorithms; 3 hours of lecture per week. Prerequisite: MAT 1210 and 1221 or Placement level 3

MAT 2532 Calculus II (4) **fall/spring**

Topics include techniques of integration; numeric integration; hyperbolic functions; indeterminate form and improper integrals; polar coordinates; partial function expansion; differential equations; and infinite series; 4 hours of lecture per week. Prerequisite: MAT 1520

MAT 2533 Calculus III (4) **fall**

This course provides students with an opportunity to continue their study of calculus and covers the traditional third semester topics in calculus: vectors, partial derivatives, multiple integrals, vector analysis, and differential equations; 4 hours of lecture per week. Prerequisite: MAT 2532

MAT 3170 Applied Mathematics for Engineering (3) **spring**

This course introduces selected topics of advanced mathematics and applies them directly to key areas of electrical and mechanical analysis. The curriculum includes selected topics in solutions of first and second order differential equations; LaPlace transforms; Fourier series; partial differential equations; numerical methods of solving ordinary and partial differential equations; and systems modeling concepts; 3 hours of lecture per week. Prerequisite: Junior standing or instructor permission, ELT 1032, 1080 or 2072, MEC 2010, and MAT 2532

MAT 3720 Topics in Discrete Mathematics (3) **fall**

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, data encryption, and combinatorics that are best understood with a foundation in logic and proof theory, set theory, probability, number theory, and the structure of modern algebra. This course will introduce the mathematical concepts and then follow them with some application of the concepts to computer science and computer technology; 3 hours of lecture per week. Prerequisite: MAT 2532

Mechanical Engineering Technology (MEC)

MEC 1000 Freshman Seminar (1) **fall**

This seminar presents an introduction to the mechanical engineering technician career and to the skills of life-long learning. Introductory design projects, research, laboratory experiments, student presentations, speakers from industry, and field trips help develop teamwork, communications, and study skills and give an overview of the broad field of mechanical engineering technology; 1 hour of seminar per week; graded Pass/No Pass. Prerequisite: None

MEC 1011 Design Communication I (2) **fall**

The 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; orthographic projection; sectional and auxiliary views; dimensioning; and fasteners are covered using hand-drawing techniques and basic drafting tools. Basic proficiency is also developed in computer-aided design (CAD) using a two-dimensional documentation software and a three-dimensional parametric solid-modeling software. The computer operating system, file management techniques, and e-mail are also introduced; 6 hours of laboratory per week. Prerequisite: None

MEC 1012 Design Communication II (3) spring

In this course, students gain proficiency in communicating mechanical designs using hand drawing and computer modeling, building on the fundamentals learned in the previous course. In addition, students gain skills in project management and teamwork. Students work in teams on short- and long-term mechanical design projects, maintaining electronic design notebooks and project web pages. Students practice two-dimensional and three-dimensional computer modeling and web authoring; 6 hours of laboratory per week. Prerequisite: MEC 1011

MEC 1020 Manufacturing Processes (2) fall/spring

This course will introduce the student to machine tools, measuring instruments, and machining operations and how they relate to the manufacturing process. The concept of the job shop and production plant will be studied and the relationship of design, production control, and manufacturing will be demonstrated. Computer-aided manufacturing (CAM) will be introduced; 1 hour of lecture, 3 hours of laboratory per week. Prerequisite: None [Course fee: \$35]

MEC 1040 Introduction to Materials Science and Engineering (3) spring

The structural nature and various mechanical properties governing the selection, use, and behavior of engineering materials, both metallic and non-metallic, are studied in this course. In the laboratory, students evaluate and control material properties through various testing, mechanical, and thermal procedures; 2 hours of lecture, 3 hours laboratory per week. Prerequisite: PHY 1041 or equivalent [Course fee: \$15]

MEC 1050 Computer Applications for Mechanical Engineering (1) fall

This course introduces the student to the college network, Microsoft, e-mail, and the internet. Focus is on the mechanical applications for spreadsheets; analysis and organization of electronic data; data acquisition and analysis; and presentation of technical information using various computer application; 2 hours of laboratory per week. Prerequisite: None

MEC 1060 Metrology and Inspection Techniques (3) as required

This course is designed to provide students with the fundamental concepts of modern dimensional metrology and related inspection techniques; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

MEC 1070 Tool Geometry and Productive Metal Cutting (1) as required

This course is designed to help students develop an understanding of the theory and practical applications of modern cutting-tool technology. After successfully completing this course, participants will be 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 laboratory per week. Prerequisite: None

MEC 2010 Fluid Mechanics and Fluid Systems (4) 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. Laboratory experience and observation develop a working knowledge of fluid properties, fluid behavior, and fluid systems for power transmission and control; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520, MEC 1050, and PHY 1041 or 1022.

MEC 2035 Statics and Strengths of Materials (4) fall

Statics involves the study of vector forces, resultants, and moments and their effect on mechanical systems and structures that are not moving. In static systems, forces and moments (torques) are balanced and known forces can be used to solve for the moments or forces in various parts of a structure. Strength of materials will familiarize students with axial and shear stress and strain; thermal deformation; torsion; shear; bending moments; beam stresses; and deflections. The course will also include the use of computer applications to solve stress and bending problems; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1520, MEC 1011, 1040, 1050, PHY 1041 [Course fee: \$35]

MEC 2040 Computer-Aided Technology (2) fall

Students develop skills to program CNC lathes and milling machines. Software linking CAD programs with CNC machines, industrial pick-and-place robots, 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 laboratory per week. Prerequisite: MEC 1020, 1011, and 1050 [Course fee: \$45]

MEC 2050 Thermodynamics and Heat Transfer (4) spring

The purpose of this course is to help the student to acquire a familiarity with the first and second laws of thermodynamics, the equations of state, perfect gas processes, and various power cycles. The student will develop some skill in applying 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; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MEC 1050 and 2010, MAT 1520, and PHY 1042

MEC 2065 Kinematics and 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 students in this course should acquire 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 laboratory per week. Prerequisite: MAT 1420, MEC 1050, 1011, and PHY 1041

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 laboratory per week. Prerequisite: None

MEC 2720 Mechanical Projects (3) spring

Through this course, the student will gain 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 this 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 laboratory per week. Prerequisite: MEC 1020 and 2035, concurrent enrollment in MEC 2065 [Course fee: \$75]

MEC 3020 Manufacturing Processes and Machine Design (3) spring

This course integrates concepts in manufacturing processes with elements of machine design. Fabrication techniques using manufacturing tools such as mills and lathes are covered, as well as an introduction to computer-aided manufacturing. Design implications of selected components such as gears, bearings, chains, belts, clutches, brakes, and couplings are discussed. The course culminates with a project that employs the practical applications of many of the covered topics; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: Junior standing in the BS.ELM program [Course fee: \$40]

Music (MUS)

MUS 1010 Music Appreciation (3) as required

This course is a survey of how classical music and opera have developed over the last thousand years. Students learn to identify different periods of music and to analyze musicians' interpretations of classical pieces. The course explores how cultural, economic, social, and political systems have supported or suppressed composers and their music; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

MUS 1028 Introduction to Rock and Roll (3) as required

This course is a survey of rock and roll music from its origins through contemporary rock. Students will discuss 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, students will explore a variety of rock styles from 1950s through the present; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

Nursing (NUR)

NUR 0111 Principles and Practices of Nursing I Lab (4) fall

This is the laboratory component of NUR 1111; 12 hours of clinical/laboratory per week, including math for meds. Prerequisite: Concurrent enrollment in NUR 1111 [Course fee: \$80]

NUR 0121 Principles & Practices of Nursing II Lab (4) winter

This is the laboratory component of NUR 1121; 12 hours of clinical/laboratory per week. Prerequisite: Concurrent enrollment in NUR 1121

NUR 0131 Principles & Practices of Nursing III Lab (4) spring 2

This is the laboratory component of NUR 1131; 18 hours of clinical/laboratory per week for the spring term. Prerequisite: Concurrent enrollment in NUR 1131

NUR 1010 Pharmacology for Nursing (3) winter

This course acquaints the student with classifications of drugs according to body systems and the use of these drugs for the purpose of restoring or maintaining health. Orem's Self-care Theory is integrated into practical application vis-a-vis a client's pharmacological needs. The course begins with basic terminology and progresses to the process of medication administration. The student studies standards and legislation as they relate to drugs. The role of the nurse, the nursing process, nutrition, and principles of ethics as they relate to pharmacology are included in the curriculum. A basic study of pharmacokinetics helps the student to understand how drugs are absorbed, transported, metabolized, and excreted. A review of pharmacotherapeutics helps the student to realize 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: NUR 1111, 0111, 1020, and BIO 2011, concurrent enrollment in BIO 2012

NUR 1020 The Nurse-Client Relationship (3) fall

The content of this course is designed to assist the nursing student to cope with the human relations challenges encountered in his/her career. Discussions encourage the student to broaden views and develop an awareness of the uniqueness of man. The course implements the philosophy and objectives of the program by stressing the importance of Orem's Self-care Deficit 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 and 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 during lectures and in NUR 0111. 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: roles of various health care 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. Prerequisite: Concurrent enrollment in BIO 1030 and 2011, NUR 1020 and 0111

NUR 1121 Principles and Practices of Nursing II (5) winter

This course offers the student an opportunity to reinforce and build upon previously learned information. The goal is to provide safe, competent, standard nursing interventions to clients experiencing recurring health care 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. The student selects appropriate goals toward meeting the client's self-care needs. Observational experiences are provided in certain specialty areas. The student is expected to demonstrate increasing ability to perform standard nursing interventions in the clinical environment with decreasing need for supervision; 5 hours of lec-

ture per week. Prerequisite: BIO 1030 and 2011, NUR 1111, 0111, and 1020, concurrent enrollment in NUR 1010 and 0121, PSY 1050, and BIO 2012

NUR 1131 Principles and Practices of Nursing III (5) spring

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 health care problems with an emphasis on parent/child care and mental health. In addition to continuing to use the nursing classroom laboratory, the student also learns through selected clinical experiences in obstetric, pediatric, and medical-surgical settings. The student demonstrates skill 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 for the spring term. Prerequisite: BIO 2012 and 1030, NUR 1021, 1121, and 0121 and PSY 1050, concurrent enrollment in NUR 0131 [Course fee: \$60]

NUR 2010 LPN to RN Transition/Trends in Nursing (2) fall

This course is designed to assist the student in recognizing both personal and professional challenges that arise in the process of transitioning from the role of the practical nurse to that of the registered nurse. Additionally, 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 scope of practice for the LPN and ADN. Current issues are examined through assigned reading, written submissions, and lively discussions. The student will ultimately develop an individual philosophy of differentiated nursing practice; 2 hours of lecture per week. Prerequisite: Concurrent enrollment in NUR 2030 and 2040 or departmental permission

NUR 2011 Advanced Pharmacology (1) spring

This course assumes that students have retained 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 clinical component of this class is demonstrated in NUR 2140. The student will integrate and evaluate the effectiveness of each client outcome as it relates to his/her pharmacological needs; 1 hour of lecture per week. Prerequisite: NUR 2030 and 2040, BIO 2120, concurrent enrollment in NUR 2130, 2140 or departmental permission

NUR 2030 Principles and Practice of Nursing IV (3) 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). The first part 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 covered. Laboratory and acute care clinical experiences are provided. The second part 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 expanded role of the registered nurse. Clinical experiences in inpatient and outpatient settings are provided. Students assist the maternity client and family to recognize their self-care needs. The third part 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. Students select appropriate roles to be assumed in assisting clients to meet their mental health self-care needs. The student is expected to perform therapeutically in the clinical setting; 3 hours of lecture per week. Prerequisite: PN License or course work or departmental permission, plus concurrent enrollment in NUR 2010 and 2040 [Course fee: \$80]

NUR 2040 Principles and Practices of Nursing IV Lab (2) fall

This course is the laboratory component of NUR 2030; 6 hours of clinical/laboratory per week. Prerequisite: Concurrent enrollment in NUR 2030 [Course fee: \$60]

NUR 2130 Principles and Practices of Nursing V (5) spring

This course offers students the opportunity to learn about clients across the lifespan experiencing complex acute medical surgical illnesses and chronic self-care deficits. Experiences are also provided in

intensive care, the emergency room, 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 be assumed in meeting the client's self-care needs. The student is expected to perform therapeutically in the clinical area with a decreasing need for instructor supervision; 5 hours of lecture per week. Prerequisite: BIO 2120, NUR 2010, 2030, and 2040, concurrent enrollment in NUR 2140 [Course fee: \$300]

NUR 2140 Principles & Practices of Nursing V Lab (4) spring

This course is the laboratory component of NUR 2130; 12 hours of clinical/laboratory per week. Prerequisite: Concurrent enrollment in NUR 2130 [Course fee: \$60]

Philosophy (PHI)

PHI 1010 Introduction to Philosophy (3) as required

In examining the history of philosophy from Socrates to Sartre, students look 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. (General Education: AH) Prerequisite: None

PHI 1030 Introduction to Logic (3) as required

This course encompasses the principles and conditions of correct reasoning, including the relationship between language and thought, deductive arguments, and the methods of inductive inference. Throughout the course, the student will be expected to apply these principles in analyzing arguments; 3 hours of lecture per week. (General Education: AH) Prerequisite: None

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. (General Education: AH) Prerequisite: None

Physics (PHY)

PHY 0100 Basic Physics (4) spring

This basic physics course in a one-semester study of the fundamental topics necessary for further study in physical sciences and engineering technologies at the college level. Credits do not count toward graduation; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: None

PHY 1030 General Physics (4) fall/spring

This one-semester, general physics course has the purpose of introducing the student to basic classical physics. Topics include Newtonian mechanics, elasticity, fluids, heat transfer, gas laws, some thermodynamics, and DC/AC circuits; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1100, placement level 4, or equivalent

PHY 1041 Physics I (4) fall/spring/summer

The purpose of this course is to give the student in engineering technology 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 non-concurrent forces); and fluids (including properties of gases, fluid pressure, density, buoyancy, and hydraulics). Previous successful completion of a course in physics is highly desirable; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: Concurrent enrollment in MAT 1420 or 2041

PHY 1042 Physics II (4) fall/spring/summer

This course is a continuation of PHY 1041 for electrical engineering technology and computer engineer-

ing technology students. Emphasis is on understanding basic physical concepts that relate both to practical situations and to subsequent technical courses. Topics include heat; wave motion; electrical and magnetic field theory; electricity; light; and semi-conductor physics; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: PHY 1041, MAT 1420

PHY 1043 Physics II for Architectural Programs (3) fall

This course for architectural students is a continuation of PHY 1041 and is a study of heat (including specific heat, latent heat, and heat transfer); wave motion; light, (including such topics as mirrors, lenses, refraction, interference, and polarization); and electricity (including such topics as electrical and magnetic field theory; light; solid-state physics; current; DC series and parallel circuits; energy; power; and AC series circuits); 3 hours of lecture per week. Prerequisite: PHY 1041

PHY 2041 Fundamentals of Physics I with Calculus (4) spring

This course, an alternative for Physics 1041, is intended for engineering technology students who have demonstrated above-average ability in verbal skills and mathematics and whose mathematics and science preparation includes algebra, plane trigonometry, and basic physics. Prior completion of a course in calculus or concurrent enrollment in MAT 1520 is required. Topics covered are systems of measurement; dynamics (including motion, acceleration, forces producing motion); work, energy, and power; momentum and conservation laws; statics (including concurrent and non-concurrent forces); and fluids (including properties of gases, fluid pressure, density, buoyancy, and hydraulics); 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1420, concurrent enrollment in MAT 1520

PHY 2042 Fundamentals of Physics II with Calculus (4) fall

Topics in wave motion; heat; electricity and magnetism; light; and solid-state and modern physics are covered; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: PHY 2041 recommended, concurrent enrollment in MAT 1520

PHY 3120 Introduction to Modern Physics (4) 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 some elementary particle theory; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: PHY 1042 or equivalent, MAT 1520

Political Science (POS)

POS 1020 American Politics & Government (3) as required

The course is a survey of the American political system with emphasis on the origins and function of the federal government and its branches and on the American political process. The nature, scope, and authority of state and local government are also covered; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

POS 2110 State and 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. (General Education: SS) Prerequisite: None

Psychology (PSY)

PSY 1010 Introduction to Psychology (3) fall/spring

This course is a study of the biological foundations and the basic psychological processes and concepts involved in human behavior, as well as an examination of the problems involved in personality adjustment and interpersonal relations; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

PSY 1050 Human Growth & Development (3) winter

This course is designed to teach the developmental stages of humans from infancy through the aging process. Course content includes general and specific principles and concepts of growth and development, as well as physical, motor, cognitive, and psychosocial characteristics of the various developmental stages. The course implements the philosophy and objectives of the program by stressing the impor-

tance of the changes that occur at each stage of the life span. There is no specific clinical laboratory, but the student is expected to apply acquired principles and concepts in determining needs and implementing care of the client through all phases of the age continuum. The unique safety needs and health care maintenance needs of each developmental stage are emphasized; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

PSY 2110 Educational Psychology (3)

summer

An examination of the principles and theories of learning as they apply to the developmental changes of the child. Special emphasis will be placed on how the child learns and ways of producing optimal conditions for childhood learning; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

Respiratory Therapy (RSP)

RSP 1010 Foundations of Respiratory Care (3)

fall

This course establishes the basis for the respiratory care profession. The history of respiratory medicine and science will be presented. Students will review the issues of quality in respiratory care and be introduced to the concept of evidence-based medicine as it applies to the practice of respiratory care. Students will be introduced to routine bedside care and patient safety, including the patient interview, measurement of vital signs, body mechanics, and infection control procedures. The topics of communication, medical ethics, and legal implications of practice will be introduced; 3 hours of lecture per week. Prerequisite: concurrent enrollment in RSP 1011

RSP 1011 Respiratory Care I (4)

fall

Students will begin to learn the skills and techniques of managing and treating patients with respiratory needs. Cardiopulmonary anatomy and physiology is introduced as the basis for understanding clinical applications of respiratory care, thus encouraging students to understand the rationale for making clinical decisions that involve patient assessment and therapeutic measures. Students will learn and practice some of the assessment skills required to make an objective evaluation of the patient's condition or response to therapy. Students will begin to develop the competence required to deliver specific respiratory care therapeutics to patients; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: concurrent enrollment in RSP 1010 [Course fee: \$125]

RSP 1012 Respiratory Care II (4)

spring

In this course, students will learn 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, as well as techniques of airway management are included. In the laboratory, students will apply their classroom knowledge of the above subjects; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: RSP 1011 and BIO 2011

RSP 1210 Respiratory Anatomy and Physiology (3)

spring

This course teaches the basic physiology of the pulmonary system. The physiological principles underlying various therapeutic, diagnostic, and monitoring procedures in respiratory care will be detailed. Students will interpret patient data, solve problems, and analyze patient cases using these physiological concepts; 3 hours of lecture per week. Prerequisite: RSP 1011 and BIO 2011

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 non-critical areas of the hospital; 8 hours clinical per week; graded Pass/No Pass. Prerequisite: BIO 2011 and RSP 1011

RSP 2011 Cardiopulmonary Disease I (5)

fall

Analysis of respiratory disturbances requires an understanding of the etiology, pathophysiology, and clinical signs of the disease, thus leading to a plan for treatment. The study of cardiopulmonary disease will begin with a presentation of advanced clinical assessment techniques. Measures used to evaluate ventilation, hemodynamics, oxygen transport, and tissue oxygenation will be discussed in relation to respiratory assessment of the critically ill patient. Chest radiographs and electrocardiographs will be presented; 5 hours of lecture per week. Prerequisite: RSP 1210 and 1012 and BIO 2012

RSP 2012 Cardiopulmonary Disease II (5)

spring

This course is a continuation of RSP 2011 and presents additional diseases affecting the pulmonary system. For each disease, emphasis is placed on etiology, pathogenesis, pathology, pathophysiology, and clinical features. A case study approach is utilized to enhance the student's ability to exercise judgment in handling patient complaints; collecting and examining data; formulating treatment options; assessing patient responses to treatment; and modifying therapy; 5 hours of lecture per week. Prerequisite: BIO 2020, RSP 2011 and 2013

RSP 2013 Respiratory Care III (4)

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 is also presented. In the classroom, students will apply these concepts to patient care scenarios. In the laboratory, students will complete a series of mechanical ventilation and critical care monitoring competencies; 3 hours of lecture, 2 hours of laboratory per week. Prerequisite: RSP 1012 and 1210 and BIO 2012

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. Students will be directly and indirectly observed performing respiratory care in the critical care and non-critical care settings; 16 hours of clinical per week; graded Pass/No Pass. Prerequisite: RSP 1601 and 2801 and BIO 2012

RSP 2603 Respiratory Clinical Experience III (6)

spring

This course is designed to provide supervised clinical experience in the critical care and specialty service areas of the hospital and in the community. There is a strong emphasis on intensive care techniques and procedures. Instruction will take place in the adult, pediatric, and neonatal areas. Students will be introduced to infant and pediatric mechanical ventilation and home care. Students will continue to gain proficiency in adult care throughout the medical system; 24 hours of clinical per week; graded Pass/No Pass. Prerequisite: RSP 2602

RSP 2801/2802 Respiratory Internship/Internship Review (0/1)

summer/spring

The summer field experience is two days a week and allows students to practice in clinical areas in which they have received instruction. Students explore non-traditional roles for respiratory therapists, volunteer their time in a selected area of practice outside of the traditional hospital practice, and summarize their experiences in written and oral reports. Students create a case study presentation while applying evidence-based medicine guidelines; 16 clinical hours per week for thirteen weeks and 32 volunteer hours; graded Pass/No Pass. Prerequisite: Permission for summer, RSP 2801 for fall [Course fee: \$250]

Sustainable Design (SDT)

SDT 1550 Erosion Prevention and Sediment Control (3)

as required

This course will focus on storm water runoff during the construction phase of a project and will present the various methodologies employed to control this potential pollution source. Coursework will provide a basic understanding of soils and how they behave when exposed during construction; 2 hours of lecture with occasional laboratory demonstrations. Prerequisite: MAT 1221, placement level 3 or equivalent

SDT 2550 Storm Water Modeling and Permitting (3)

as required

This course will focus on Vermont storm water permitting and modeling of storm water systems using HydroCAD; 2 hours of lecture, 2 hours of laboratory/studio per week. Prerequisite: None

SDT 2560 Introduction to Solar Photovoltaic Technology (2)

as required

This course introduces the basics of solar photovoltaic technology, including solar resource assessment; PV materials and modules; systems components; system sizing and design basics; mechanical mounting systems; installation methods; and performance analysis. The course prepares a student to take the NABCEP PV Solar Entry-Level Knowledge certificate exam; 21 hours of lecture, 21 hours of laboratory. Prerequisite: None

SDT 3000 Sustainable Design and Technology Seminar (1) fall

This course brings together the diverse group of students who enter the SDT program and introduces them to the concept and ethos of sustainability. Readings, films, and other media will be used and outside speakers will be invited. Students will explore their own particular interests in sustainability and present their findings to the class. Internship opportunities will be discussed; 1 hour of seminar per week. Prerequisite: None

SDT 3010 Mediation and Communication (3) spring

This course introduces students to the basic causes and nature of human conflict. Students will use case studies and role playing to explore the nature of working in groups, the types of conflict that occur, and very basic techniques that can be used to discuss, explore, and sometimes resolve conflict; 3 hours of lecture per week. (General Education: SS, except for SDT students) Prerequisite: Junior standing

SDT 3020 Environmental Permitting (2) spring

This course introduces students to the federal, state, and local permitting process. Issues include an introduction to the legal foundation of the permitting process and a historic perspective on environmental permits. Typical topics include the Clean Water and the Clean Air Acts, the Vermont 2000 Farm Bill, Act 250 hearings, and planning and zoning boards. Students will be required to attend permit hearings outside of regular class hours; 1 hour of lecture, 3 hours of studio per week. Prerequisite: None [Course fee: \$10]

SDT 3111 Energy Systems and Sustainability (3) spring

This course provides a survey of the technical issues related to energy systems and resources. An overview of energy conversion systems will be studied in terms of current and potential capacity, distribution issues, technology installation, and life-cycle costs. Energy resources are reviewed in terms of supplies, production, and distribution. Specific technical topics will include the drivers for sustainable energy development; current energy systems (fossil fuel, nuclear, hydroelectric); internal combustion systems; distribution and power transmission; electrical systems; and renewable energy technology, biofuels, biomass systems, and hydrogen-based technology; 3 hours of lecture per week. Prerequisite: CIS 1050 or equivalent and math placement level 2 or higher

SDT 3119 Introduction to Leadership in Energy and Environmental Design (1) fall

The purpose of this course module is to provide an understanding of the codes and standards that govern the determination of the sustainable design status of buildings. The course will focus on the USGBC's Leadership in Energy & Environmental Design "Green" building rating system for new construction, as well as the energy standards that are included in it, particularly ASHRAE 90.1, 62, and 55. The course will include case studies and an example project on which students will be expected to assess the LEED standard. Lectures introduce topics and methods of application; the laboratory emphasizes the application of the LEED standard and required documentation; 2 hours lecture, 2 hours of laboratory per week for 6 weeks. Prerequisite: Concurrent enrollment in ARE 3112

SDT 3121 Sustainable Design and Technology Studio I (3) fall

Through short team projects, all Sustainable Design and Technology students will begin to solve interdisciplinary problems in sustainable design, applying basic concepts learned in the Sustainable survey courses and the technical courses in each discipline. Students will work in interdisciplinary teams on projects that focus on each discipline. Student teams will participate in a stepped process involving problem evaluation, design alternatives, calculations, graphic representation, and presentation to the class and a professional panel. The course introduces students to the design of low-energy systems in small buildings and provides tools for analysis in the schematic phase; 6 hours of studio per week. Prerequisite: SDT 3010 [Course fee: \$25]

SDT 3130 Environmental Soils (3) fall

The student will develop a basic understanding of soils and how soils are considered a resource in Vermont. The course will stress understanding of soils in the current and anticipated environmental permitting requirements. This course focuses on hands-on familiarity with soils, soil characteristics, maps, tools, resources, and technical writing; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: MAT 1210 or placement level 2 [Course fee: \$50]

SDT 4020 Ground and Surface Water (3) spring

The student will develop a basic understanding of hydrology in subsurface and surface environs. The groundwater unit will cover water flow dynamics, chemical characteristics, drinking water, well hydraulics, water supply source protection and groundwater contamination. Surface water topics include geomorphology of rivers and streams, chemical characteristics of surface water, watershed planning, and storm water run-off; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: Junior standing in SDT program

SDT 4030 Renewable Energy Systems (3) spring

This course introduces students with a background in engineering and technology to renewable energy systems. Thermal and electric power-based technologies are studied in terms of resource assessment and analysis; component-level system design and integration; energy efficiency; siting analysis and installation issues; performance monitoring; and policy and regulations. Laboratory activities involve work with solar thermal, wind, solar PV, and other technologies and activities include resource assessment and analysis; system design and integration; installation and system performance monitoring; and energy system simulation and optimization. Case studies and system and installation designs are developed; 2 hours of lecture, 3 of hours of laboratory per week. Prerequisite: ARE 3050 or MEC 2010 and 2050, ELT 2072, 1032, or 1080

SDT 4110 Building Controls & Commissioning (3) fall

This course in the Green Buildings technical core looks at two important areas for sustainable commercial buildings: integrated control systems and the hands-on 'fine tuning' that is essential for a building to operate efficiently. The first part of the course will concentrate on an overview of digital control systems (electrical circuits and basic system design). The second part of the course focuses on the detailed knowledge needed for the emerging field of building commissioning, now a requirement of the LEED certification process; 2 hours of lecture, 2 hours of laboratory per week. Prerequisite: ARE 3010 and SDT 3110, concurrent enrollment in ARE 4030

SDT 4112 Green Sites Technical Survey (3) fall

This course introduces students to issues related to environmentally responsible site design. Students will gain a broad view of issues related to sustainable site development including environmental resource identification, site permitting, civil design parameters, utilities, ecological landscape design, and agricultural potential. Use of natural features and best practices will be highlighted, utilizing GIS and real-world scenarios; 2 hours of lecture, 2 hours of studio per week. Prerequisite: None

SDT 4113 Green Buildings Technical Survey (3) spring

This course introduces issues related to the design, delivery, construction, and assessment of "green" buildings. Students will obtain an overview of events and environmental conditions that sparked the green building movement, as well as acquire an understanding of how to implement and evaluate integrated design strategies, building materials, and systems. We will discuss methods for measuring building performance, costing models for determining financial feasibility, and various "alternative" building techniques for both residential and commercial buildings; 3 hours of lecture per week. Prerequisite: SDT 3111 and 4112

SDT 4122 Sustainable Design and Technology Studio II (3) spring

This capstone project course is a continuation of SDT Studio I to build on the skills of the individual disciplines developed there. This course will bring multidisciplinary student teams together to solve real life problems that integrate the knowledge of all the SDT concentrations. Working with a client and experts in the field, each team will develop and present their concepts for a sustainable solution. This course requires that students draw upon solid knowledge of the SDT core, as well as the technical courses in their own concentration. The final solutions will be presented to the class and a panel of professionals; 6 hours of studio per week. Prerequisite: SDT 3121 [Course fee: \$25]

SDT 4130 Sensitive Ecosystems (3) spring

Through study of local ecosystems, complex interactions and interconnected relationships will be explored. Students will develop critical and analytical thinking and communication skills by participating in course discussion and written work. The course aims to provide students with a deeper appreciation

of the complexity of natural ecosystems and the impacts of human and natural disturbance. Students will be able to provide examples of critical interactions within ecosystems and identify situations where ecosystems have become broken or where humans are creating synergies; 3 hours of lecture per week. Prerequisite: BIO 1020, LAH 1050 *or* SDT 3130, 4112

SDT 4801/4802 Summer Internship/Internship Review (0/1) summer/fall

Students enroll in the internship upon successful completion of their junior year core curriculum. The internship requires students to spend at least 5 weeks in an employment setting with an institution or firm that is employing, or seeks to employ, sustainable technology. This practicum is designed to broaden a student's understanding of how sustainable technologies are implemented in the real world. Students will be enrolled in the 1 credit internship review in the following fall term; graded Pass/No Pass. [Course fee: \$250]

Social Science (SSC)

SSC 2010 Science, Technology, and 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, as well as the ways that social structures influence the development of science and technology. Guest lecturers discuss the responsibility of the individual technician. Students give oral presentations and engage in class debates; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

SSC 2030 Energy and Society (3) as required

This course is designed to enable students to gain insights into the energy issue and to promote energy awareness and conservation. Topics will include a history of energy use; forms of energy; energy resources; renewable sources; the economics of energy production and consumption; and relevant social issues regarding energy. Appropriate field trips and guest lectures are scheduled; 3 hours of lecture per week. (General Education: SS) Prerequisite: None

SSC 2120 Gothic Themes & Social Issues in Film (3) as required

Since the creation of the earliest copyrighted motion picture in January of 1894, filmmakers have knowingly or unknowingly 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 alike both contend that these films are "one of the best measures of the American consciousness". This course chronologically examines the changes and shifts in American cultural attitudes and values and explores the fears that accompany them. It asks students 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. (General Education: SS) Prerequisite: ENG 1061 or equivalent

SSC 2130 Labor Studies (3) as required

3 hours of lecture per week. (General Education: SS) Prerequisite: 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 each student's own ethics and values. The course begins with an overview of historical definitions of service in our country and in other cultures so that students are better able to understand their opinions and actions within a historical and global context. Most importantly, a major segment of this course involves direct service, providing students with ongoing hands-on experience for reflection and analysis along with their reading, writing, research, and classroom discussion; 3 hours of lecture per week. (General Education: SS) Prerequisite: ENG 1061 or equivalent

SSC 3045 News and 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. The course is offered on-line. Prerequisite: ENG 1061 or equivalent

SSC 3120 Gothic Themes and Social Issues in Film (3)

as required

Since the creation of the earliest copyrighted motion picture in January of 1894, filmmakers have knowingly or unknowingly chronicled the fears, anxieties, and cultural changes inherent in American culture. No film genre has captured or reflected these cultural changes as aptly or in-depth as the American horror film. History and film scholars alike both contend that they are “one of the best measures of the American consciousness.” This course chronologically examines the changes and shifts in American cultural attitudes and values and explores the fears that accompany them. It asks students 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 cultural shifts within American culture. The course is offered on-line and is writing-intensive. Prerequisite: Junior standing or instructor permission

Technical Education (TEC)

TEC 1110 Issues and Trends in Technical Education (3)

summer

This course is designed to provide in-depth coverage of current issues in technical education with a historical perspective on the development of programs in Vermont; 3 hours of lecture per week. Prerequisite: None

TEC 1120 Reading in Technical Education Content Areas (3)

summer

This course is designed to assist technical center teachers in the development of techniques that will allow them to teach basic reading skills as an integrated part of their technical classroom. The primary focus will be on teaching skills for “reading to learn” about subject content. Technical center classrooms by nature are a process-centered mode. Students learn in ways that allow direct application to technical job requirements. This course emphasizes the same process-centered approach for the teaching of reading skills; 3 hours of lecture per week. Prerequisite: None

TEC 1130 Vocational Instruction for Students with Special Needs (3)

summer

This three credit course is designed to inform technical educators about students who are members of special populations, including methods of identification, assessment, modifications, and accommodations provided to these individuals and the role of the technical educator in these processes; 3 hours of lecture per week. Prerequisite: None

Telecommunications (TCT)

TCT 1000 Telecommunications Seminar (1)

fall

This course is an orientation to the college experience including an analysis and discussion of learning styles, time management, test-taking, and study skills. 1 hour of lecture per week. Prerequisite: None

TCT 1001 Telecommunications I (4)

fall

This course is an introduction to the techniques, principles, and terminology of voice telecommunications. Public and private telecommunication networks will be examined. Telecommunication equipment, switching, and transmission technology will be demonstrated. The frequency spectrum, modulation schemes, and multiplexing techniques will be explored. Lectures, interactive learning, and demonstrations will be employed. Laboratory exercises will be required; 3 hours of lecture, 3 hours laboratory per week. Prerequisite: None

TCT 1002 Telecommunications II: Introduction to Voice & Data (4)

spring

An introduction to the techniques, principles, and terminology of data communications will be presented. Public and private networks will be examined. Data communication equipment, multiplexing, and interactive learning demonstrations will be employed. Laboratory exercises will be required; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: TCT 1001

TCT 2003 Telecommunications III: LANS and WANS (4)

fall

This course is designed to train students in the organization, architecture, setup, maintenance, hardware, and software aspects of computer networks. Topics include an introduction to networks; types and characteristics of different network architectures (LAN to WAN); network topologies and cabling; intra- and inter-network devices; network operating systems; peer-to-peer and client/server environ-

ments; LAN setup and maintenance; inter-network communications, including connecting a LAN to the Internet; remote network access; network printing; network security; and world wide web servers. A hands-on approach will be taken, with team projects throughout; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: TCT 1002

TCT 2004 Telecommunications IV: Advanced Topics (4) spring

A survey of current and emerging technologies in Telecommunications will be presented. Lectures, interactive learning, demonstrations, and site visits will be employed; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: TCT 2003

Theatre Arts (THA)

THA 2070 Comedy in Film (3) as required

This course focuses on the psychological, social, and dramatic roots of comedy, as well as reviewing the social context of American comedy. Students will study paired films from different time periods, all of which use elements of comic structure, characterization, plot, symbolism, and themes. This course is writing-intensive; 2 hours of lecture, 2 hours of laboratory per week. (General Education: AH) Prerequisite: ENG 1061 or equivalent

Veterinary (VET)

VET 1020 Animal Anatomy and Physiology (4) spring

Covered in this course are the anatomy and physiology of organs and organ systems in animals. There is emphasis on basic physiology common to domestic animals; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite: BIO 2320 [Course fee: \$20]

VET 1030 Animal Care and Restraint (3) fall

This course teaches the principles of animal 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. Laboratories stress hands-on experience with the handling, restraint, physical exam, and administration of medications to common domestic species and to laboratory animals. Proficiency in performance of laboratory tasks is evaluated; 2 hours of lecture, 3 hours of laboratory per week. Prerequisite: None

VET 1040 Animal Diseases (4) spring

Bacterial, viral, fungal, and parasitic diseases are discussed with a review of disease prevention practices. Laboratories 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 laboratory per week. Prerequisite: VET 1030, BIO 2320

VET 1051 Animal Care I (1) fall

This course is designed to give students hands-on experience in the daily care and maintenance of farm, laboratory, and pet animals. Students are assigned times to care for the colony dogs, cats, laboratory animals, birds, sheep, horses, and dairy animals under supervision. This course is repeatable for credit; selected hours throughout the term; graded Pass/No Pass. Prerequisite: None

VET 1052 Animal Care II (1) spring

This course is designed to give students hands-on experience in the daily care and maintenance of farm, laboratory, and pet animals. Students are assigned times to care for the colony dogs, cats, laboratory animals, birds, sheep, horses, and dairy animals under supervision. This course is repeatable for credit; scheduled hours throughout the term; graded Pass/No Pass. Prerequisite: VET 1051 or instructor permission

VET 1060 Laboratory Techniques (4) spring

Students learn 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 laboratories is emphasized; 3 hours of lecture, 3 hours of laboratory per week. Prerequisite:

VET 1030, BIO 2320

VET 2011 Veterinary Clinical Techniques I (4)

fall

Students learn the stages of anesthesia and how to induce and monitor anesthesia under the direct supervision of a veterinarian. Surgical nursing skills associated with aseptic technique and proper protocols in the surgery suite are covered. Pre- and post-op monitoring, record keeping, and client education skills are practiced. Students perform 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 laboratory per week. Prerequisite: VET 1030, 1020, 1040, and 1060

VET 2012 Veterinary Clinical Techniques II (3)

spring

This course provides instruction in radiography of both large and small animals. The laboratories review anesthesia while the students learn to position animals for radiographs and develop, handle, and store the films. Ancillary techniques such as dentistry procedures are also covered. Students perform 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 laboratory per week. Prerequisite: VET 2011, 2050, and 2070

VET 2030 Animal Nutrition (2)

fall

This course familiarizes the student with various nutrients and their metabolism. Diet formulation for common domestic and laboratory animals is covered, including species variation in nutritional requirements. The use of prescription diets for small animals is discussed. Practical information regarding client education for feeding both large and small animals is presented. Nutritional-related diseases are also discussed; 2 hours of lecture per week. Prerequisite: CHE 1020, BIO 2320, and VET 1020

VET 2040 Reproduction and Genetics (3)

spring

This course provides instruction in genetics and comparative reproductive physiology of domesticated animals. Reproductive management is covered, including heat detection; determination of pregnancy; management of pregnant animals and parturition; and reproductive failure. Students gain information on how to assist veterinarians with reproductive and obstetrical procedures; 3 hours of lecture per week. Prerequisite: BIO 2320 and VET 1020 and 2070

VET 2050 Applied Laboratory Methods (4)

fall

Students learn medical nursing skills including bandaging, responding to medical emergencies, performing CPR, handling trauma cases, preparing animals for certain 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 laboratory per week. Prerequisite: VET 1020, 1040, and 1060

VET 2060 Veterinary Office Procedures (3)

spring

Students review material on professionalism and interactions with clients that they have been introduced to in other courses. This course then provides additional information on interpersonal communication, professional correspondence, legal issues regarding medical records, organizing an office, financial record keeping, and OSHA compliance. Practical information on evaluating a potential job position and getting and keeping a job is presented; 3 hours of lecture per week. Prerequisite: Sophomore standing in VET program or instructor permission

VET 2070 Pharmacology and Toxicology (3)

fall

Calculation of drug doses, dispensing, and administration of medications are reviewed. The metabolism of commonly-used veterinary medications and their beneficial and potential harmful effects on the body are covered. Students become familiar with common poisonous substances and plants and gain information on assisting the veterinarian in treating toxicity cases; 3 hours of lecture per week. Prerequisite: VET 1020, 1040, and 1060 and CHE 1020

VET 2080 Animal Behavior (2)

spring

This course is designed to give veterinary technology students grounding in the natural behaviors of the common domestic species. Included are the neural, genetic, and endocrine bases for these behav-

iors. In addition, many aspects of clinical behavioral medicine also are covered. Included are 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 in VET program or instructor permission

VET 2090 Veterinary Technician National Exam Seminar (1) spring

This course is a comprehensive review of the core curriculum material presented in the first three semesters of the veterinary technician program. The purpose is to prepare students for standardized professional examinations, such as the Veterinary Technician National Exam (VTNE); 2 hour of seminar each week; graded Pass/No Pass. Prerequisite: VET 2030, 2050, 2070, and 2011.

VET 2720 Veterinary Supervisor (1) fall/spring

This supervisory course is required for all veterinary technology students. This course is repeatable for credit; graded Pass/No Pass. Prerequisite: Sophomore standing and two semesters of animal care

VET 2801/2802 Summer Externship/Externship Review (0/1) summer/fall

Students are enrolled in the externship after successful completion of the first-year core curriculum. The externship consists of a summer practicum of a minimum of 300 hours. Students may attend one or more sites in order to gain the appropriate experiences. Successful completion of the externship is required for graduation. After successful completion of the summer externship, students are enrolled in the externship review seminar in the subsequent and fall term. The review is a letter-graded one credit course. Prerequisite: Sophomore standing [Course fee: \$250]

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**Instructor is on sabbatical for all or part of the 2012–2013 academic year*

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