THE COLLEGE OF ENGINEERING AND MATHEMATICAL SCIENCES

http://www.uvm.edu/~cems/

The college offers stimulating, professionally-oriented programs for students interested in careers in engineering, computer science, mathematics, statistics and data science. An engineering education combines the study of mathematics and the physical, life, and engineering sciences with application to the analysis and design of devices, equipment, processes, and complete systems to serve the needs of humanity. The breadth and flexibility of the engineering programs at UVM provide a sound background for engineering practice in public or private domains, for graduate study in engineering and science, and for further professional study in such fields as business, law, or medicine. Computer science develops creative problem-solving ability, along with essential skills in current programming and computing environments. It offers the flexibility to gear studies toward business, science, engineering, mathematics, and the arts. The study of mathematics and statistics is designed to train students in critical thinking, problem solving, and sound reasoning, while developing a strong level of technical competence and a substantial breadth of exposure to other fields. Data science is a unique, interdisciplinary educational program that combines studies in computer science, mathematics and statistics to prepare students for careers in big data science and analytics, rapidly growing fields with huge unmet demand. Degrees in each of the CEMS disciplines provide distinctive recognition based on challenging course work, valuable field experience, and intensive student-faculty interaction.

MAJORS

- Biomedical Engineering B.S.BME. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/biomedicalengineeringbs/)
- Civil Engineering B.S.CE. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/civilengineeringbs/)
- Computer Science B.S.CS. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/computerscience/computersciencesbs/)
- Computer Science and Information Systems B.S. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/computerscience/computersciencesinformationbs/)
- Data Science B.S. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/datascience/)
- Electrical Engineering B.S.EE. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/electricalengineeringbs/)
- Engineering B.S.E. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/engineeringbs/)
- Engineering Management B.S.E.M. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/engineeringmanagementbs/)
- Environmental Engineering B.S.EV. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/environmentalengineeringbs/)
- Mathematics B.S.MSC. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/mathematicsandstatistics/mathematicsbs/)
- Mechanical Engineering B.S.ME. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/mechanicalengineeringbs/)
- Statistics B.S.MSC. (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/mathematicsandstatistics/statisticsbs/)

MINORS AND CERTIFICATES

- Computer-Aided Engineering Technology (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/interdisciplinaryengineeringprograms/computeraidedengineeringtechnologycertificate/) - Undergraduate Certificate
- Computer Science (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/computerscience/computerscienceminor/)
- Electrical Engineering (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/engineering/electricalengineeringminor/)
- Geospatial Technologies (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/interdisciplinaryengineeringprograms/geospatialeotechnologiesminor/)
- Mathematics: Pure (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/mathematicsandstatistics/mathematicspureminor/)
- Statistics (http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/mathematicsandstatistics/statisticsminor/)

REQUIREMENTS

LAPTOP REQUIREMENTS AND RECOMMENDATIONS

Engineering Programs

Engineering is a professional field that leverages mathematics and the sciences to design and implement solutions to societal problems. Along with the fundamentals of math and science, practicing engineers must utilize computational tools to accomplish their tasks. With this reality in mind, all UVM engineering programs require students to have a laptop computer. The engineering laptop is large enough to enable students to design complex CAD models and powerful enough to allow instructors to incorporate computational
analysis and numerical examples in the classroom for immediate and powerful praxis of engineering theory.

Mathematics, Statistics, Computer Science and Data Science Programs

The computer is an essential tool for learning and professional work in all CEMS programs, and students utilize computing technologies throughout the CEMS curricula. The laptop requirement in the Mathematics, Statistics, Computer Science or Data Science programs specifies a laptop that is designed to provide ample power and meet a student’s needs throughout the duration of their studies.

Laptop specifications are available on the CEMS website.

REGULATIONS
ACADEMIC STANDARDS

The required minimum semester and cumulative grade point average (GPA) for good academic standing in the College of Engineering & Mathematical Sciences (CEMS) is 2.00. Additional regulations for each CEMS degree are outlined in the individual department, program or degree sections of this catalogue.

Academic performance is reviewed at the end of each regular (fall and spring) semester. CEMS Student Services – a division of the CEMS Dean’s Office – is responsible for reviewing academic performance and notifying students who are not in good academic standing. Notification of trial status and dismissal for low scholarship is sent to the student’s UVM email account.

Criteria for Placement on Trial
A student earning less than a 2.00 semester or cumulative GPA will be placed on trial.

Criteria for Continuation on Trial
A student who has been on trial for one or more semesters but does not meet the criteria for removal from trial or dismissal for low scholarship (see below) will be continued on trial.

Criteria for Dismissal for Low Scholarship
A student earning less than a 2.00 semester GPA for two successive semesters, or less than 2.00 cumulative GPA for three successive semesters will be dismissed for low scholarship. A student will be dismissed for low scholarship only after the student has been on trial for the preceding graded term of attendance.

Appealing Dismissal for Low Scholarship
A student who has been dismissed for low scholarship normally has the opportunity to appeal the dismissal in writing to the CEMS Studies Committee within the timeframe stipulated in the dismissal letter. As a condition of a student’s reinstatement following an initial dismissal, the CEMS Studies Committee may prohibit a future dismissal appeal as specified in the student’s reinstatement letter.

Criteria for Removal from Academic Trial
A student who has been placed on trial or continued on trial is removed from trial when both the semester and cumulative GPA are 2.00 or higher.

DISMISSAL FOR LOW SCHOLARSHIP
First Dismissal
A student who is dismissed for low scholarship for the first time is dismissed from CEMS and UVM for a full academic year. If dismissal occurs at the end of fall semester, the student will be suspended from continued enrollment through the end of the following fall semester. If dismissal occurs at the end of spring semester, the student will be suspended from continued enrollment through the end of the following spring semester. (Note: A student dismissed at the end of spring semester is eligible to return in the summer or fall term of the following year).

Second Dismissal
A student who is dismissed for low scholarship for the second time is dismissed from CEMS and UVM for two full academic years.

Third Dismissal
A student who is dismissed for low scholarship for the third time is dismissed from CEMS and UVM. The third dismissal for low scholarship is final.

READMISSION AFTER DISMISSAL
A dismissed student who presents evidence of the ability to perform satisfactorily may be considered for readmission on trial. A student who has been dismissed for low scholarship for a second time will not be considered for readmission on trial until at least two years have elapsed. A student who has been dismissed for low scholarship for a third time will only be considered for readmission if the student is granted an Academic Reprieve. Further information regarding readmission may be obtained from CEMS Student Services.

A student must earn a minimum 2.00 semester GPA the first semester after readmission. A student must raise the cumulative GPA to at least 2.00 by the end of the second semester after readmission, or earn a minimum semester GPA of 2.50 during the second semester back and all subsequent semesters until the cumulative GPA is 2.00 or higher. A student who fails to meet these academic performance requirements will be dismissed for low scholarship.

For additional information on academic standing and the trial, dismissal and readmission processes, please contact CEMS Student Services.

INTERNAL TRANSFER GUIDELINES

Students currently enrolled in another College or School at UVM who would like to transfer into or pursue a dual degree in CEMS should complete the appropriate form(s) available through the myUVM portal. In order to be admitted for transfer into CEMS, internal transfer applicants must be in good academic standing (not
currently ‘on trial’) in their current program(s) of study and have no pending incompletes in current or previous coursework.

Internal transfer inquiries are welcome at any time of the year. Exceptions to the requirements and timeline outlined below may be considered for students with extraordinary circumstances. To discuss the internal transfer process and curriculum matters, please contact CEMS Student Services.

<table>
<thead>
<tr>
<th>MAJOR(S)</th>
<th>MINIMUM GPA (cumulative &amp; semester)</th>
<th>ADDITIONAL GPA RESTRICTIONS</th>
<th>PREREQUISITE COURSES/ GRADES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering (All)</td>
<td>2.0</td>
<td>Minimum 2.0 in Engineering, Mathematics, Statistics, Physics, Chemistry and Computer Science coursework</td>
<td>MATH 021 w/ B- or higher OR MATH 019 w/ B or higher; lab science course w/ C or higher</td>
</tr>
<tr>
<td>Computer Science; Computer Science &amp; Information Systems</td>
<td>2.0</td>
<td>Minimum 2.0 in all courses with CS prefix</td>
<td>One of CS 008, CS 020 or CS 021 w/ C or higher</td>
</tr>
<tr>
<td>Mathematics; Statistics</td>
<td>2.0</td>
<td>None</td>
<td>MATH 021 w/ C or higher OR MATH 019 w/ B or higher</td>
</tr>
<tr>
<td>Data Science</td>
<td>2.0</td>
<td>None</td>
<td>MATH 021 w/ C or higher OR MATH 019 w/ B or higher &amp; one of CS 008, CS 020 or CS021 w/ C or higher</td>
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</tbody>
</table>

TRANSFER APPLICATION TIMELINE

Fall Transfers
Students who wish to begin a CEMS major at the start of the fall semester are strongly encouraged to complete the application process by July 1st. CEMS cannot guarantee consideration of applications submitted during the fall add/drop period until after the close of the fall semester. All internal transfer requests submitted after the fall add/drop period will be considered after the close of the fall semester.

Spring Transfers
Students who wish to begin a CEMS major at the start of the spring semester are strongly encouraged to complete the application process by January 1st. CEMS cannot guarantee consideration of applications submitted during the spring add/drop period until after the close of the spring semester. All internal transfer requests submitted after the spring add/drop period will be considered after the close of the spring semester.

UVHONORS COLLEGE

CEMS students who are co-enrolled in the University’s Honors College must follow the requirements outlined in the Honors College section of this catalogue. Specific HCOL coursework is required for first year students and sophomores. CEMS students writing an Honors College thesis must follow the steps outlined on the HCOL website. Note that prescribed deadlines are based upon a standard eight semester path to graduation in which students enroll in thesis credits during the fall and spring semesters of a single academic year. Deadlines will be appropriately adjusted for students following an alternate path. Such students are expected to work closely with the Honors Thesis Advisor to designate deadlines.

Thesis Prep
CEMS students writing an Honors College thesis must do the following during the junior year:

1. Identify an Honors Thesis Advisor, by the first few weeks of the spring semester of the junior year.
2. Enroll in CEMS 101 (generally in the spring semester). The course CEMS 101 (HCOL Research Experience) is an additional credit of research-related work, supervised by the CEMS HCOL Representatives.
3. Identify an Honors Thesis Committee. The Committee is comprised of two members, including the advisor. At least one Committee member must be in the student’s major department.

Thesis Proposal

In the fall of senior year, CEMS/HCOL students must prepare a five-page thesis proposal, which should include sections on background, related literature, a specific work plan, and the anticipated format of the final thesis. This proposal should be submitted to the student’s Honors Thesis Committee by October 1; students will be notified of approved projects by November 1. The student’s advisor will notify the appropriate CEMS HCOL Representative that a thesis project has been approved.

Thesis

CEMS Honors College students must enroll in a two-semester, six-credit Honors Thesis Course sequence. Course sequences vary by department.

When thesis credits are spread across two semesters, students making satisfactory progress towards completion of the thesis during the first semester are awarded a grade of Satisfactory Progress (SP) for a semester of thesis research, and course credit is awarded. Students not making satisfactory progress toward the thesis earn a grade of Unsatisfactory Progress (UP), and no credit is awarded. When the student finishes the second semester and earns a final grade, the
instructor assigns that grade for the second semester, and changes the grade of SP that had been entered for the previous semester to match the final grade. The temporary SP grade does not affect a student’s GPA. Once the final grade is entered and the SP is converted to a standard letter grade, that letter grade is calculated as part of the GPA.

Timing of specific thesis progress reports is at the discretion of the student’s Honors Thesis Advisor and the student’s Honors Thesis Committee, and should be consistent with the approved thesis proposal, as described above. The thesis is due to the student’s Honors Thesis Committee by April 1 of the senior year.

**Thesis Defense**

Students must give some public oral presentation of the thesis, within two weeks following the initial thesis submission, and no later than April 15 of the senior year. The presentation should be about thirty minutes long, and must be attended by the Honors Thesis Committee and announced publicly at least one week prior to the presentation date. No formal evaluation is associated with the presentation, which should serve as a discussion of the thesis, with the goal of providing constructive suggestions towards improving the final manuscript. A final grade for the thesis is assigned by the thesis advisor, who also makes the determination as to whether or not the thesis work warrants honors designation. All revisions are due by April 30.

**DEPARTMENTS AND PROGRAMS**

- Electrical and Biomedical Engineering ([http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/electricalandbiomedicalengineering/](http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/electricalandbiomedicalengineering/))
- Interdisciplinary Engineering Programs ([http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/interdisciplinaryengineeringprograms/](http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/interdisciplinaryengineeringprograms/))
- Computer Science ([http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/computerscience/](http://catalogue.uvm.edu/undergraduate/engineeringandmathematicalsciences/computerscience/))