

**MEMO**

**To:** The UVM Faculty Senate  
**From:** Curricular Affairs Committee of the Faculty Senate, Laura Almstead, Chair  
**Date:** April 6, 2017  
**Re:** Approval of a proposal for a new undergraduate Certificate in Computer-Aided Engineering Technology

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At its meeting on April 6, 2017, the Curricular Affairs Committee unanimously approved the action recommended in the following memo.

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The Curricular Affairs Committee unanimously approved a proposal for a new undergraduate Certificate in Computer-Aided Engineering Technology (CAET) submitted by the College of Engineering and Mathematical Sciences (CEMS). If approved by the Faculty Senate and Board of Trustees, the program will be offered beginning fall 2017.

***Program Description, Rationale, and Evidence for Demand***

Computer-Aided Engineering Technology (CAET) is the broad usage of computer software to aid in engineering analysis, design and marketing. The term encompasses design, validation, simulation and optimization of products and manufacturing tools. CAET systems are playing an increasing role with regard to information to help support design teams in decision-making. CAET is used in many fields such as automotive, aviation, space, and shipbuilding industries. One of the components of CAET is Drafting and Design (CADD or CAD) which is the term for an evolving set of computer based tools used for the development, communication and evaluation of product designs.

The proposed CAET certificate is designed to give UVM undergraduates a critical skill set identified by business and governmental groups at both the state and national levels. Successful completion of the CAET certificate enables employers to evaluate applicants by reviewing the class curriculum and student portfolios. Certificate recipients will be prepared for evolving technologies due to a sound basis in computerized design software combined with a mastery of three dimensional form and location geometry. Therefore, the certificate would allow those that completed it to enter the workplace in fields such as mechanical, land development or structural design with core competencies that foster an immediate positive impact to an employer.

***Relationship to Existing Programs***

There are no other certificate programs at the University with a primary focus on CAET. The minor in Geospatial Technologies/Geographic Information Systems requires either GEOG 081 or CE 10, both of

which are optional courses in the proposed certificate. There is one computer-aided design (CAD) course, CDAE 101 Computer-Aided Drafting and Design, that is required for a minor in Green Building and Community Design (GBCD) offered by the Department of Community Development and Applied Economics. CDAE 101 is included as an elective for the certificate in CAET.

**Curriculum**

Successful completion of the proposed CAET certificate requires a minimum of fifteen credits (8 credits of required courses and 7 credits of elective courses). Two core foundation classes establish a sound basis in computerized automation techniques combined with the mastery of three dimensional form and location geometry. Elective courses facilitate a focus into specific sub-disciplines. Some of these elective courses are from other academic units. Those units are aware and have agreed to a few additional students.

<b>Required Courses (8 credits)</b>		<b>Credits</b>
ENGR 002	Graphical Communications	2
ENGR 112	Building Information Modeling	3
ENGR 114	Advanced 3D Drafting	3
<b>Elective Options (minimum of 7 credits)</b>		<b>Credits</b>
CE 10	Geomatics	
CDAE 101	Computer-Aided Drafting and Design	
CDAE 131	Applied Design Studio: Light Frame Building	
GEOG 081	Geospatial Concepts and Visualizations	
ENGR 116	Virtual Instrumentation	
NR 143	Intro to Geographic Information Systems	

Three of the courses, ENGR 112/114/116, have been offered as ENGR 195's and are now permanent courses in the course catalog.

As part of the course descriptions, both ENGR 112 and ENGR 114 require design projects. The project requirements integrated into these courses provide a capstone design experience for students, and serve as the required integrative learning component required for undergraduate certificate programs at UVM.

**Admission Requirements and Process**

There are no special requirements for UVM students to complete the course sequence. Students will be required to declare their intent to earn a certificate for the sequence.

**Anticipated Enrollment and Impact on Current Programs**

The proposers anticipate as few as five students in the first year with growth of up to twenty over five years. All the courses in the sequence are currently being offered and have capacity. Undergraduate certificates provide UVM students additional credentials, and are not designed to substitute for degree

programs. The only minor in the engineering departments is in Electrical Engineering. There are not course overlaps between the proposed certificate in CAET, and thus the proposers do not anticipate that inauguration of the certificate would impact enrollment in that minor.

### ***Advising***

The CEMS academic advisors will handle advising for UVM students wishing to complete the certificate.

### ***Resource Requirements***

All courses included in the proposed curriculum are currently being offered and have capacity for additional students. Existing CEMS labs have capacity for on-site courses. Online course needs will be met with the existing Virtual Computer system. The ENGR prefix courses (002/112/114/116) have been configured as hybrid courses as part of the normal pedagogical development. Both ENGR 002 and ENGR 116 have been further developed as fully online courses using funding from an existing UVM CEMS Department of Labor grant (TAACCCT). Therefore, no additional resources are required.

### ***Evidence of Support***

Letters of support were provided by Luis Garcia, Dean of the CEMS; Thomas Vogelmann, Dean of the College of Agricultural and Life Sciences; Jane Kolodinsky, Department Chair for Community Development and Applied Economics; and Nancy Mathews, Dean of the Rubenstein School of Environment and Natural Resources; Cynthia Belliveau, Dean of Continuing and Distance Education; and William A. Falls, Dean of the College of Arts and Sciences.

### ***Summary***

The proposed certificate program offers a coherent set of courses that meet an expressed need from employers for professional technical training. Courses in the curriculum all have capacity for more students, and the proposal has support of participating units. Therefore, the new certificate serves as a way to use existing resources to offer a valuable credential to UVM undergraduates.