Engineering Education Graduate Certificate

The Certificate of Engineering Education was established as a joint effort by the College of Engineering and College of Education to better equip graduate students with the skills necessary to teach engineering courses at the collegiate level.

The certificate requires 12 credits, with courses offered in both the spring and fall terms, and is complimentary to graduate study in engineering and education.

Courses

Foundational knowledge needed for quality teaching includes knowledge in four areas: content, learning theory, pedagogical theory, and measurement theory. In addition to knowledge, skills need to be developed to apply this knowledge to the classroom. The content knowledge comes from all the engineering classes students will have completed throughout their undergraduate and graduate courses in engineering.

The remaining knowledge and skills will be acquired through the curriculum of the Engineering Education Certificate. First, learning theory (CESP 820) provides the foundational knowledge of cognitive theory, behaviorism, motivation, epistemological beliefs, and cultural differences. Essentially, these are factors within the learner that need to be nurtured and guided to facilitate university level learning.

Second, pedagogical theory and application (CI 816) include socio-cultural learning, constructivism approaches, and curriculum development. Pedagogy is the application of learning theories to teaching. Knowledge of instructional strategies, classroom materials, collaborative learning, and advising are elements of teaching.

Third, a university faculty member must be able to monitor and evaluate the learning of students. The course in evaluation and program assessment (CESP 811) will provide knowledge and skills in test construction, evaluation of the test, interpretation of tests results, and subsequently modifications on instruction based on these interpretations. Program evaluation, another component of this course, enables graduate engineering students to take an active role in any university accreditation process. In other words, program evaluation skills are an added value to their degree when they enter the competitive market of university professorship.

Fourth, the internship (CI 816A) is the capstone activity for the Engineering Education Certificate. Ultimately, the engineering students need the opportunity to put their knowledge to use in authentic classroom situations. This ensures that they have the ability to apply their knowledge. It also allows them to gain experience under the joint mentorship from College of Education and College of Engineering faculty members.
## CONTENT KNOWLEDGE -- What you've learned in your engineering coursework.

### 1. LEARNING THEORY -- How students learn and process information.

<table>
<thead>
<tr>
<th>Relevant course</th>
<th>What you get from it ...</th>
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</thead>
</table>
| Learning Theory and Instruction (CESP 820) | • Foundational knowledge of cognitive theory, behaviorism, motivation, epistemological beliefs and cultural differences.  
• Understanding how to nurture and guide students to facilitate university level learning. |

### 2. PEDAGOGICAL THEORY -- How to apply learning theories to teaching.

<table>
<thead>
<tr>
<th>Relevant course</th>
<th>What you get from it ...</th>
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</table>
| Developing Critical and Creative Thought (CI 816) | • Foundational knowledge of socio-cultural learning, constructivism approaches and curriculum development  
• Knowledge of instructional strategies, use of classroom materials, collaborative learning and advising. |

### 3. MEASUREMENT THEORY -- How to monitor and evaluate the learning of students.

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<thead>
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<th>What you get from it ...</th>
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</table>
| Principles of Measurement and Program Evaluation (CESP 811) | • Knowledge and skills in test construction, evaluation of tests, interpretation of test results, and how to modify instruction approaches based on these interpretations.  
• Program evaluation skills. |

### 4. INTERNSHIP -- Using your new skills in a classroom.

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<thead>
<tr>
<th>Relevant courses</th>
<th>What you get from it ...</th>
</tr>
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<tbody>
<tr>
<td>Internship: Developing Critical and Creative Thought (CESP 816A)</td>
<td>• The opportunity to put your knowledge to use in authentic classroom situations.</td>
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Admission Requirements:

Students seeking this graduate certificate program must be Wichita State University Engineering graduate students in good standing either in a degree-bound program or in non-degree, category "A" status. This requirement is in addition to the guidelines for WSU Graduate Certificate Programs which must be met. Students should contact the Graduate School to determine if they need to apply for admission to this status, or need to reactivate their enrollment file.

Students who have not completed graduate coursework at Wichita State University will need to apply for admission to Category A status in an appropriate area of engineering, by submitting an application, and application fee to the Graduate School.

Two official transcripts from all schools attended must be sent directly to the Graduate School from the institution issuing the transcript, or must be submitted to the Graduate School office in envelopes sealed by the issuing institution, if issued to student.

Degree Admission – The student must have earned a bachelor’s degree from a regionally accredited institution or a recognized institution in another country whose requirements for the bachelor’s degree are substantially equivalent to an American four-year bachelor’s degree in an education field. The student must also have a grade point average of at least 2.750 based upon the last 60 hours of course work (or nearest semester or term break to this), including any post-bachelor’s graduate work, and no more than 9 hours of background deficiencies in the desired field. Some programs may require a higher minimum grade point average.

Non-Degree, Category A – Students who already possess a graduate degree and who do not wish to pursue a second degree, should apply for non-degree, category A admission. The student must have earned a bachelor’s degree in an education field from a regionally accredited institution or a recognized institution in another country whose requirements for the bachelor’s degree are substantially equivalent to an American four-year bachelor’s degree. The student must also have a grade point average of at least 2.750 based upon the last 60 hours of course work (or nearest semester or term break to this), including any post-bachelor’s graduate work. Some programs may require a higher minimum grade point average.

Certificate Requirements:

- CESP 820 Learning Theory and Instruction – 3 hours (Spring)
- CESP 811 Principles of Measurement and Program Evaluation – 3 hours (Fall)
- CESP 816 Advanced Methods: Developing Critical and Creative Thought – 3 hours (Spring)
- CESP 816A Internship: Developing Critical and Creative Thought – 3 hours (Fall)
Completion process:

1. Student must notify the program area in writing of intent to complete the certificate.
2. In the semester the certificate requirements are met students must:

   • Prepare (with graduate advisor) and submit (to the Graduate School) a Plan of Study (for the certificate).
   • Submit an Application for Graduate Certificate form, along with the $15 filing fee, to the Graduate School no later than the 20th day of classes for the fall or spring semester or the 10th day of classes for the summer semester.

Contact Information:

Engineering

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