

# Engineering+ Program

Engineering+ at Wichita State offers a variety of experiential learning opportunities for students to complete alongside their undergraduate education. In response to the recommendation of the National Academy of Engineering report on the future needs for engineering graduates, the College of Engineering implemented the Engineering+ program.

This program makes the educational experience more meaningful to the student and the student more desirable to local and national industries.

## Program Requirements

In addition to the course requirements for an engineering or computer science BS degree at WSU, each student must complete at least **three of the seven** following activities:

- Cooperative Education or Internship (p. 1)
- Entrepreneurship and Innovation (p. 1)
- Global Learning or Study Abroad (p. 1)
- Multidisciplinary Education (p. 1)
- Undergraduate Research (p. 1)
- Leadership (p. 1)
- Service Learning (p. 2)

### **Cooperative Education or Internship**

Students gain practical experience working for an employer using skills and knowledge that complement the strong academic fundamentals they learn in the classroom. Co-op experiences instill the professionalism, understanding and confidence that lead to a lifetime of success.

Co-op/Internship credit is facilitated by the Applied Learning team.

1. Meet the following requirements:
  - a. Must be a degree-bound WSU student.
  - b. Must be enrolled in at least 6 hours of credit at WSU. (Does not apply to summer semester.)
  - c. Must have a 2.500 GPA or higher.
  - d. Must have completed at least 24 credit hours; 9 credit hours must be in student's major. (Credit hours may be transferred to WSU or earned in high school.)
2. Secure a co-op/internship position.
3. Enroll in a zero or one credit hour Cooperative Education course in major department.
4. Meet one of the following work hour requirements for co-op/internship Engineering+ requirement:
  - a. 40 hours per week for one semester (fall or spring).
  - b. 20 hours per week for two semesters (fall and spring).
  - c. 40 hours per week for two summer semesters.

### **Entrepreneurship and Innovation**

Students build an entrepreneurial mindset, skillset and relationships that are invaluable to developing innovative and impactful solutions to today's problems.

To earn credit for entrepreneurship and innovation, a student must:

1. Serve one year as a WSU University Innovation Fellow; or
2. Successfully compete in an approved entrepreneurial competition, such as the Koch Innovation Challenge ( ENGR 102B, ENGR 205), Shocker Innovation Corps or Shocker New Ventures Competition.

Talk to your academic advisor or department chair to seek pre-approval for entrepreneurial or innovation opportunities not listed above.

### **Global Learning and Study Abroad**

Global learning prepares students for a landscape that increasingly requires an international window and familiarity with other cultures.

Students have three opportunities to receive Engineering+ credit for global learning and study abroad:

- Earn an undergraduate certificate in Global Competency;
- Participate in a global learning project within a class at WSU; or
- Complete a credit-bearing course in a foreign country where English is not the predominant language.

### **Multidisciplinary Education**

Multidisciplinary education helps prepare students to effectively work with people from different backgrounds, gaining advantage of diversity of thought and ideas.

Students have four options for fulfilling the multidisciplinary education criterion of Engineering+:

- Earn a minor;
- Earn a certificate offered outside of primary program;
- Earn a second major or double degree; or
- Work on a two-semester project as part of a multidisciplinary team with student members outside of the College of Engineering.

University policy requires 3 credit hours of unduplicated coursework in each minor. To earn Engineering+ credit, the College of Engineering requires 3 credit hours of unduplicated coursework in a certificate.

Certificates and degrees earned at other institutions can satisfy this requirement, if outside of student's major area and approved by the department chair.

### **Undergraduate Research**

Research collaborations enable students to be knowledge creators and to gain insight into the process of discovery. Students in the College of Engineering work under the supervision of a faculty member, who approves the activity, either as an undergraduate researcher for one semester, or complete an independent study course.

To earn Engineering+ credit, students must complete one of the following:

- Compete in the university Undergraduate Research and Creative Activity Forum;
- Submit research for presentation at a conference; or
- Co-author a journal or paper.

### **Leadership**

Leadership is defined as the knowledge and practice of skills necessary to lead a team. Students increase character building, develop a vision that motivates others to collaborate, increase communication and create value.

To get leadership credit for Engineering+, students must complete the following three steps:

#### **Step 1) Leadership Training**

Students must first complete a formal leadership training. While it is not required to complete a class for college credit, there is a list of approved courses (below) at Wichita State that qualify as leadership training/instruction.

Other training opportunities may also exist through the military, place of employment, through Student Involvement or community organizations. *Students must obtain preliminary approval of non-course training from their department by submitting supporting documentation of the training.*

Course	Title	Hours
<b>Approved E+ Leadership Training Courses</b>		
COMM 328	Teamwork, Leadership and Group Communication	3
ENGR 501/501H	The Engineer as Leader	3
FYPH 102B	First-Year Seminar: Leadership and Self Discovery	3
HNRS 152F	Leadership Challenge	3
HNRS 310Q	Honors Tutorial - Engaging Leaders	1
HNRS 310R	Honors Tutorial - Evolving Leaders	1
HNRS 310S	Honors Tutorial - Emerging Leaders	1
HNRS 310V	LeaderShape Institute	1
HNRS 351	Survey of Leadership	3
ID 301	Leadership is Essential Seminar	3
IME 664	Engineering Management	3
MGMT 360	Principles of Management	3
MGMT 462	High Performance Leadership	3
PSY 413/PHS 408	Adaptive Leadership	3

### Step 2) Leadership Activity

After completing an approved leadership course or other formal training, students must complete a leadership activity where they successfully lead others to an established goal.

The leadership activity must be one where the student has clearly demonstrated the application of the leadership skills taught in the course or formal training.

*Note: Students in the aerospace engineering (AE) department, electrical and computer engineering (ECE) department, and the School of Computing (SoC) must receive pre-approval from an advisor before completing the leadership activity.*

### Step 3) Leadership Summary Report

After completion of leadership training and a leadership activity, students must submit a one-page summary report to their department. The summary report will be assessed using a rubric (<https://wichita.edu/engineering/leadership-rubric/>). Students must receive a score of '8' or better on the report in order to receive Engineering+ credit.

Leadership reports must be submitted to their department for processing.

### Service Learning

Service learning sees students participating in projects that serve the community's needs, as part of the engineer's responsibility to society. Through this experience, students develop professionalism and a practical perspective by connecting the classroom to the real world.

There are two ways to earn service learning credit for Engineering+:

- Participate in an approved project that uses engineering or computer science skillsets and serves a community need, as part of a service learning course (ex. ENGR 102C or ENGR 302). *Note: Students must meet service learning requirements defined within the course*

*in the term of enrollment to obtain the corresponding service learning.*

- Complete a total of 40 hours of volunteer service that uses engineering or computer science skillsets and serves a community need. *Note: Students must submit a one-page summary report along with their approval form for this option. The pre- and post-reflection templates below can be used to plan out the summary report.*

Service learning opportunities may be found in existing classes and through outreach initiatives such as Engineers Without Borders, GoBabyGo!, STEM mentoring and more.

Any service learning project should:

- Be an organized service activity consisting of an intentional and thought-provoking application of classroom learning to active and engaging work by participating in a group project that meets identified community needs;
- Include structured reflection on the service activity to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of civic responsibility (Bringle & Hatcher, 1995; Totten & Pederson, 1997); and
- Benefit the community (broadly defined) and opportunities for service can address a wide variety of community needs.

Course instructor or project advisor may be asked to verify successful completion of project and reflections.