



WESTERN ILLINOIS UNIVERSITY

Pre-Engineering

Department of Physics, College of Arts and Sciences

Why Engineering?

Engineering is a broad field encompassing many career options that emphasizes the application of our understanding of physical law in the design and development of useful products for society. Engineers must have a solid grasp of the physical laws that describe how the natural world operates. They must be able to work competently with the language that describes these laws: mathematics. They must also have an interest in and an eye for applications and processes that can be of benefit to society. Engineers are truly at the cutting edge in terms of the development of modern technology.

Employment prospects for engineers are good across all disciplines. Interest in students graduating in Engineering remains high among private and government employers. Starting salaries for bachelor's degree holders in engineering fields also remain high—highest in electrical and mechanical engineering. Our future economy continues to depend upon engineers who can understand the scientific principles behind the technology.

Engineering vs. Engineering Technology

According to the National Society of Professional Engineers, "Engineering programs are geared toward development of conceptual skills, and consist of a sequence of engineering fundamentals and design courses, built on a foundation of complex mathematics and science courses. Engineering technology programs are oriented toward application, and provide their students introductory mathematics and science courses, and only a qualitative introduction to engineering fundamentals. Thus, engineering programs provide their graduates a breadth and depth of knowledge that allows them to function as designers. Engineering technology programs prepare their graduates to apply others' designs" (Engineering Technology, NSPE Issue Brief #4049).

What Is Pre-Engineering?

A Pre-Engineering program is an educational package designed to meet the first requirement for the education of a traditional engineer—a foundation of complex mathematics and science courses. This foundation is common to nearly all types of engineering education and can often be provided more efficiently by a smaller university or college than by the institutions which house the engineering colleges themselves. Additionally, the Pre-Engineering program provides flexibility to the student who is still considering which engineering program and field to enter.

Why Select WIU-Macomb's Pre-Engineering Program?

The strong coordinated Pre-Engineering program at the WIU-Macomb campus will qualify students to transfer with little difficulty to the University of Illinois at Urbana-Champaign (UIU-C). Completion of the program with a satisfactory grade point average (GPA) provides an opportunity for students with less than perfect high school transcripts and ACT scores to transfer to one of the best engineering programs in the world. Students who transfer from Western are historically very successful at UIU-C and in their future careers. Although the program is designed for students who wish to transfer to UIU-C, Pre-Engineering students are well-prepared to succeed in any engineering program around the country.

Western Illinois University provides good economic value; low student-to-faculty ratios in all the core courses; and excellent faculty in the areas of Physics, Mathematics, and Chemistry who are committed to the success of the students both in the classroom and through one-on-one interaction. Students at Western can pursue Engineering studies through our Pre-Engineering, Engineering Physics, and Physics Bachelor of Science (BS)/Engineering Master of Science (MS) options. The student can also switch from Engineering to Physics, Chemistry, Mathematics, Computer Science, or Engineering Technology majors.

HIGHER VALUES IN HIGHER EDUCATION

Pre-Engineering Program at WIU-Macomb

The Pre-Engineering program described below prepares students for a smooth transfer to the Engineering School at the WIU-Quad Cities campus as well as to a number of engineering colleges in the region after two years of preparation.

First Year				Second Year			
<i>Fall Semester</i>		<i>Spring Semester</i>		<i>Fall Semester</i>		<i>Spring Semester</i>	
Math 133	4 SH	Math 134	4 SH	Chem 201	4 SH	Chem 202	4 SH
Phys 197	4 SH	Phys 198	4 SH	Math 231	4 SH	Math 333	3 SH
Eng 180	3 SH	MET 105*	3 SH	Math 183	1 SH	Phys 201	3 SH
Elective	3 SH	CS 225***	3 SH	Phys 200	4 SH	Phys 312**	4 SH
Elective****	3 SH	Elective****	3 SH	Math 311	3 SH	Eng 280	3 SH
17 SH		17 SH		16 SH		17 SH	

* MET 105 is not required of Electrical Engineers or majors in Computer Science. Take an elective in social sciences or the humanities instead.

** Physics 312 (or 310) is recommended for transfer to some departments; see your adviser.

*** CS 225 does not have a prerequisite, but it may be advisable to take CS 211/212 first.

**** This is an FYE course or language course to satisfy UIU-C's language requirement.

Engineering Physics Option at WIU-Macomb

The Department of Physics at WIU-Macomb offers a dual-degree program in Engineering and Physics. This program, in addition to the Pre-Engineering core, requires an additional year at Western to complete several upper-division courses in Physics as well as the University's general education curriculum. Students then complete their degree in Engineering either as a double major at the WIU-Quad Cities campus or as a transfer at one of the engineering schools in the region. Upon completion of their Engineering studies, students receive a BS in Engineering Physics from WIU-Macomb and a BS in Engineering from their second institution.

Physics BS/Engineering MS Option

This option involves completing your Physics degree at WIU-Macomb and then enrolling in an Engineering Master's degree program to get your career-specific engineering education. Many engineering schools actively recruit Physics majors to enroll in their engineering program at the master's level. Their experience has been that well-prepared Physics students often have a stronger conceptual understanding and greater flexibility for pursuing upper-level engineering studies than Engineering graduates. "Contrary to popular belief, an undergraduate degree in mechanical engineering is NOT required for admission to our graduate program. In fact, many of our best graduate students come from science backgrounds at liberal arts colleges" (Steve Girshick, Director of Graduate Studies, University of Minnesota, 2002).

Engineering Program at WIU-Quad Cities

Beginning in the fall of 2009, Western Illinois University offers a BS degree in Engineering at the WIU-Quad Cities campus. This program is a 2+2 program that articulates with Pre-Engineering programs at the WIU-Macomb campus and community colleges. The Engineering program focuses on the practice of engineering by providing a broad curriculum which emphasizes basic engineering fundamentals, while allowing students to select an area of emphasis in Mechanical/Manufacturing Engineering or Electrical/Computer Engineering. Students seeking admission to the Engineering program must have an overall GPA of 2.5 and a grade of "C" or better in the Pre-Engineering core courses.

Transferring to the University of Iowa

Also beginning in the fall of 2009, Western has an articulation agreement with the University of Iowa's College of Engineering. Students from WIU-Macomb will be accepted automatically into the Engineering College if they complete the Pre-Engineering or Engineering Physics options at WIU-Macomb with a 3.0 GPA and no more than one "C" grade in the Pre-Engineering core.

Transferring to the University of Illinois at Urbana-Champaign

Transfer students are admitted on a competitive basis depending on space available. Transfer students must have a minimum 2.6 GPA on a 4.0 scale for consideration. The cutoff for Fall 2008 was a 3.0 GPA (in the Pre-Engineering core courses) for Mechanical Engineering, Electrical and Computer Engineering, and Computer Science and a 2.8 GPA for other departments.

wiu.edu/physics

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