

# MECHANICAL/CIVIL ENGINEERING, ASSOCIATE OF SCIENCE

The Associate of Science (AS) in Mechanical/Civil Engineering program will provide the first two years of the engineering core curriculum for students pursuing civil or mechanical engineering as a transfer degree. The coursework is foundational to the upper division schools and provides the fundamental concepts needed for success and advancement in the civil and mechanical engineering profession.

This degree satisfies the requirements for an AS degree and was designed to transfer to Oregon Institute of Technology's College of Engineering or Oregon State University's College of Engineering. Please consult your advisor for details.

## GRADUATION REQUIREMENTS

Students must complete a minimum of 105 credit hours with a cumulative Grade Point Average (GPA) of 2.0 or better. All courses must be completed with a grade of 'C' or better. Twenty-four (24) credits must be completed at Southwestern before the AS degree is awarded.

Courses that are developmental in nature, (designed to prepare students for college transfer courses), are not applicable to this degree.

Students must complete the graduation application process one term prior to the term of completion (e.g., spring term graduates must apply during winter term).

## LEARNING OUTCOMES

- Students will demonstrate the ability to solve engineering problems using a variety of mathematical and computational methods.
- Students will learn and apply the required ethics expected in a professional engineering setting.
- Students will gain fundamental understanding of engineering principles including fundamentals of equilibrium of forces, and moments, an understanding of material responses to applied and reaction loads, and fundamental electrical circuits.
- Students will demonstrate problem solving experience through various methods including use of higher level computer programming 2-D and 3-D CAD modeling.
- Students will demonstrate an ability to think critically and design feasible solutions to proposed design problems.
- Students will be able to communicate designs and results effectively.
- Students will demonstrate an ability to function in interdisciplinary teams.

## PRE-PROGRAM COURSES

Students are required to take the following courses *prior to* the program courses, depending on students' college placement information. See advisor for details:

Code	Title	Credits
MTH112	Trigonometry (or higher)	4
CIS90	Computer Basics	2
WR90R	Academic Literacy (or higher)	4

## PROGRAM GUIDE

Course	Title	Credits
<b>First Year</b>		
<b>Fall</b>		
CHEM221	General Chemistry I	5
MTH251	Calculus I Differential Calculus	4
WR121	English Composition	3
ENGR111	Intro to Engineering	3
ECON201 or ECON202	Microeconomics or Macroeconomics	4
Credits		19
<b>Winter</b>		
CHEM222	General Chemistry II	5
MTH252	Calculus II Integral Calculus	4
SP111	Fundamentals of Public Speaking	3
ENGR112	Engineering Computation	4
Arts & Letters <sup>1</sup>		3
Credits		19
<b>Spring</b>		
BI103	General Biology <sup>2</sup>	4
MTH253	Calculus III Infinite Sequences And Series	4
WR227	Report Writing	3
DRFT110	Computer Assisted Drafting I	3
Arts & Letters <sup>1</sup>		3
Credits		17
<b>Second Year</b>		
<b>Fall</b>		
ENGR211	Statics	3
PH211	General Physics with Calculus I	5
ENGR201	Electrical Fundamentals I <sup>5</sup>	4
MTH254	Vector Calculus I	4
Credits		16
<b>Winter</b>		
PH212	General Physics with Calculus II	5
ENGR212	Dynamics	3
ENGR202	Electrical Fundamentals II <sup>5</sup>	4
PE231	Wellness for Life <sup>4</sup>	3
Cultural Diversity <sup>3</sup>		3
Credits		18
<b>Spring</b>		
PH213	General Physics with Calculus III	5
ENGR213	Strength of Materials	3
MTH256	Differential Equations	4

MTH260	Matrix Methods and Linear Algebra	4
	Credits	16
	Total Credits	105

- <sup>1</sup> Select appropriate course in specific subject area from the course listed in AS General Education Requirements category.
- <sup>2</sup> BI101, BI102, BI103, BI201, BI202, BI203, BI234, ENV235, F250 may be substituted. Transfer to OIT for Civil Engineering should substitute G201.
- <sup>3</sup> Cultural Diversity: ANTH224, ANTH231, ANTH232, HST104, HUM204, HUM205, HUM206.
- <sup>4</sup> Health, Wellness, and Fitness courses include PE231, HE250, or any combination of PE185 courses totaling three (3) credits.
- <sup>5</sup> GEOG265 may substitute for ENGR201 or ENGR202 for students transferring to OIT Civil Engineering.
- \* All Honors courses may substitute for their equivalent requirements.