

# 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 pro-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 107 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.

Math and writing placement are unique to each student and are determined during the admissions and intake advising process. Additional math or writing courses may be required prior to taking the math or writing program requirements in this degree. For more information on placement methods used, visit our college placement policy here.

## 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	4
ENGR111	Intro to Engineering	3
ECON201 or ECON202	Microeconomics or Macroeconomics	4
<b>Credits</b>		<b>20</b>
<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
<b>Credits</b>		<b>19</b>
<b>Spring</b>		
BI103	General Biology <sup>2</sup>	4
MTH253	Calculus III Infinite Sequences And Series <sup>6</sup>	4
WR227	Report Writing	4
DRFT110 or DRFT112	Computer Assisted Drafting I or Computer Assisted Drafting III	3
Arts & Letters <sup>1</sup>		3
<b>Credits</b>		<b>18</b>
<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
<b>Credits</b>		<b>16</b>
<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
<b>Credits</b>		<b>18</b>
<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 <sup>6</sup>	4
<b>Credits</b>		<b>16</b>
<b>Total Credits</b>		<b>107</b>

<sup>1</sup> Select appropriate course in specific subject area from the course listed in AS Arts & Letters 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> PE231, HE250, or three (3) credits of PE185 sport/activity courses will satisfy this requirement.
- <sup>5</sup> GEOG265 may substitute for ENGR201 or ENGR202 for students transferring to OIT Civil Engineering.
- <sup>6</sup> MTH264 and MTH243 may be substituted for MTH253 and MTH260. Students transferring to Oregon State in Civil Engineering must take MTH264 and MTH243.
- \* All Honors courses may substitute for their equivalent requirements.