

# Department of Engineering

## Mission Statement

The engineering program prepares graduates to be engineering leaders who are able to coordinate multidisciplinary teams to research, design, and implement solutions with consideration of standard procedures, ethical practices, contemporary technologies, and the impact on creation for God-honoring service to the profession, community, and world.

## Engineering Major

### Bachelor of Science

Students in the Engineering major learn to apply fundamental knowledge of mathematics, science, and engineering to the creative development of solutions to complex technical problems. The core curriculum provides students with an understanding of ideas that have shaped human thinking in engineering and the humanities, arts, and sciences. This broad perspective gives students the context to comprehend the intentions of God's plan for human activity and realize the environmental, economic, ethical, sustainable, social, and safety impact of their engineering designs on creation and mankind. Graduates are well prepared to pursue employment in industry and to pursue graduate studies in engineering and related fields. The degree is granted upon completion of credits specified on pages 48-49 (40 credits must be successfully completed in 3000- or 4000-level courses).

The Bachelor of Science in Engineering program is accredited by the Engineering Accreditation Commission of ABET (<https://www.abet.org>), under the General Criteria.

- **Scientific & Quantitative Literacy** courses in core curriculum: mathematics course MAT2121; natural science course PHY1201/1201L.
- **Engineering students** must have a laptop computer capable of running applications in Windows (see department-specific recommendations at myUNW and viewing the Information Technology Services page).

### Engineering Core . . . . . 46 cr

CHE1021/1021L	Principles of Chemistry I . . . . .	4
MAT2121	Calculus and Analytic Geometry I (SEE SCIENTIFIC & QUANTITATIVE LITERACY REQUIREMENT ABOVE)	4
MAT2122	Calculus and Analytic Geometry II . . . . .	4
MAT3223	Calculus and Analytic Geometry III . . . . .	4
MAT3252	Calculus-based Statistics . . . . .	4
MAT3335	Differential Equations with Applied Linear Algebra .4	
PHY1202/1202L	Engineering Physics I (SEE SCIENTIFIC & QUANTITATIVE LITERACY REQUIREMENT ABOVE)	4
PHY1202/1202L	Engineering Physics II . . . . .	4
EGR1005	Introduction to Engineering . . . . .	4
EGR2105	Statics and Dynamics . . . . .	4
EGR2206	MATLAB . . . . .	2
EGR2207	Thermodynamics . . . . .	3
EGR3115	Materials Science . . . . .	3
EGR4311	Engineering Design I [WCE] . . . . .	3
EGR4312	Engineering Design II [OCE] . . . . .	3

### Concentration . . . . . 30 cr

Select a concentration. Requirements are listed below.

#### Civil Engineering Concentration (30 cr)

EGR2145	Surveying Fundamentals . . . . .	2
EGR2205	Mechanics of Materials . . . . .	3
EGR3225	Fluid Mechanics . . . . .	3
EGR3245	Structural Analysis . . . . .	3
EGR3246	Materials Laboratory for Civil Engineering . . . . .	2
EGR3347	Geotechnical Engineering . . . . .	3
EGR3348	Soils Testing Laboratory . . . . .	2
SCI1010/1010L	Environmental Science . . . . .	4

#### Technical Electives . . . . . 8

Select from EGR-prefix courses at the 3000 or 4000 level.

Students may not receive credit toward the major for both EGR3246 and EGR3326. A maximum combined 4 credits allowed from EGR4841 and EGR4995.

#### Electrical Engineering Concentration (30 cr)

COS3001	C Programming . . . . .	2
EGR2107	Introduction to Electronics and Electrical Circuits . . 3	
EGR2108	Electronics and Electrical Circuits Laboratory . . . . .	2
EGR3215	Control Systems . . . . .	3
EGR3235	Electronic Devices . . . . .	4
EGR3236	Digital Electronics Laboratory . . . . .	2
EGR3335	Microcontrollers . . . . .	2
EGR3337	Signals & Systems . . . . .	3
EGR3338	Communication Systems Laboratory . . . . .	2
MAT3226	Applications in Digital Logic . . . . .	2

#### Technical Electives . . . . . 5

Select from EGR-prefix courses at the 3000 or 4000 level.

Students may not receive credit toward the major for both EGR3246 and EGR3326. A maximum combined 4 credits allowed from EGR4841 and EGR4995.

**ENGINEERING**

## Mechanical Engineering Concentration (30 cr)

EGR2107	Introduction to Electronics and Electrical Circuits ..	3
EGR2108	Electronics and Electrical Circuits Laboratory .....	2
EGR2125	Design and Manufacturing Laboratory .....	2
EGR2205	Mechanics of Materials .....	3
EGR3215	Control Systems .....	3
EGR3225	Fluid Mechanics .....	3
EGR3326	Materials Laboratory for Mechanical Engineering. .	2
EGR3327	Heat and Mass Transfer .....	3
EGR3328	Thermal-Fluids Laboratory .....	2

**Technical Electives** .....7  
 Select from EGR-prefix courses at the 3000 or 4000 level. Students may not receive credit toward the major for both EGR3246 and EGR3326. A maximum combined 4 credits allowed from EGR4841 and EGR4995.

## General Engineering Concentration (30 cr)

EGR2107	Introduction to Electronics and Electrical Circuits ..	3
EGR2108	Electronics and Electrical Circuits Laboratory .....	2
EGR2205	Mechanics of Materials .....	3
EGR3215	Control Systems .....	3

**Select one of the following:**

COS3001	C Programming .....	2
EGR2125	Design and Manufacturing Laboratory .....	2
EGR2145	Surveying Fundamentals .....	2

**Technical Electives** ..... 17  
 Select from EGR-prefix courses at the 3000 or 4000 level. Students may not receive credit toward the major for both EGR3246 and EGR3326. A maximum combined 4 credits allowed from EGR4841 and EGR4995.

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