ENGINEERING, B.S.E.

Program Educational Objectives

The Engineering degree from Point Loma Nazarene University is designed to provide a foundation for productive engineering practice. Our recent graduates will engage in:

- **Problem Solving and Continuous Learning:** Applying critical thinking and principles from engineering, science, and mathematics to identify customer-centric solutions to complex problems, while fostering a commitment to the lifelong learning necessary to be an effective engineer.
- **Sustainable and Ethical Practices:** Designing and implementing safe, sustainable, and practical engineering solutions that economically address societal needs while considering global and ethical implications of their work.
- **Collaboration and Communication:** Working effectively in multidisciplinary teams to understand the big picture and their role in the project, while demonstrating leadership, professionalism, and communication skills.

Program Learning Outcomes

Graduates of the program will demonstrate:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- an ability to communicate effectively with a range of audiences.
  - Students will effectively communicate complicated technical information in writing.
  - Students will effectively communicate complicated technical information orally.
  - Students will be able to identify, locate, evaluate, and effectively and responsibly use and cite information for the task at hand.
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Concentrations

- Computer Engineering (p. 1)
- Electrical Engineering (p. 1)
- Mechanical Engineering (p. 2)

Computer Engineering Concentration[1]

Code	Title	Units
Lower-Division Requirements		
CSC 2054 and CSC 2054L	Data Structures and Algorithms and Data Structures and Algorithms Lab	4
EGR 1003 and EGR 1003L	Introduction to Engineering I and Introduction to Engineering I Lab	3
EGR 1023 and EGR 1023L	Introduction to Engineering II and Introduction to Engineering II Lab	3
EGR 1043 and EGR 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
EGR 1054 and EGR 1054L	Objects and Elementary Data Structures and Objects and Elementary Data Structures Lab	4
EGR 2024 and EGR 2024L	Circuit Analysis and Circuit Analysis Lab	4
MTH 1064 and MTH 1064L	Calculus I (GE) and Calculus I Lab (GE)	4
MTH 1074 and MTH 1074L	Calculus II and Calculus II Lab	4
MTH 2074	Calculus III	4
PHY 2044 and PHY 2044L	University Physics I (GE) and University Physics I Lab (GE)	4
PHY 2054 and PHY 2054L	University Physics II and University Physics II Lab	4
Upper-Division Requirements		
EGR 3014	Operating Systems	4
EGR 3023	Software Engineering	3
EGR 3053 and EGR 3053L	Analog Electronics and Analog Electronics Lab	3
EGR 3073	Networking and Security	3
EGR 3093 and EGR 3093L	Digital Electronics and Digital Electronics Lab	3
EGR 4003	Information and Computer Security	3
EGR 4054	Computer Architecture and Assembly Language	4
EGR 4072	Senior Project I	2
EGR 4082	Senior Project II	2
EGR 4092	Internship in Engineering	2
EGR 4103	Electrical Signals and Systems	3
MTH 3033	Differential Equations	3
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3
Total Units		**79**

Electrical Engineering Concentration

Code	Title	Units
Lower-Division Requirements		
EGR 1003 and EGR 1003L	Introduction to Engineering I and Introduction to Engineering I Lab	3
EGR 1023 and EGR 1023L	Introduction to Engineering II and Introduction to Engineering II Lab	3
EGR 1043 and EGR 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
EGR 2014 and EGR 2014L	Engineering Mechanics: Statics and Engineering Mechanics: Statics Lab	4

Code	Title	Units
EGR 2024 and EGR 2024L	Circuit Analysis and Circuit Analysis Lab	4
MTH 1064 and MTH 1064L	Calculus I (GE) and Calculus I Lab (GE)	4
MTH 1074 and MTH 1074L	Calculus II and Calculus II Lab	4
MTH 2074	Calculus III	4
PHY 2044 and PHY 2044L	University Physics I (GE) and University Physics I Lab (GE)	4
PHY 2054 and PHY 2054L	University Physics II and University Physics II Lab	4
Upper-Division Requirements		
EGR 3003	Python and UNIX	3
EGR 3053 and EGR 3053L	Analog Electronics and Analog Electronics Lab	3
EGR 3062	Electricity, Magnetism, and Waves I	2
EGR 3083	Electricity, Magnetism, and Waves II	3
EGR 3093 and EGR 3093L	Digital Electronics and Digital Electronics Lab	3
EGR 3113	Measurement and Instrumentation	3
EGR 4043 and EGR 4043L	Embedded Systems and Robotics and Embedded Systems and Robotics Lab	3
EGR 4063	Solid State Engineering	3
EGR 4072	Senior Project I	2
EGR 4082	Senior Project II	2
EGR 4092	Internship in Engineering	2
EGR 4103	Electrical Signals and Systems	3
MTH 3033	Differential Equations	3
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3
PHY 3003 and PHY 3003L	Modern Physics and Modern Physics Lab	3
Choose a minimum of one (1) course from the following:		1-2
CSC 3011	Machine Learning and Multivariate Modeling in R	
CSC 3022	Data Management for Data Analytics	
CSC 3031	Data Visualization and Communication with R	
Total Units		**79-80**

Mechanical Engineering Concentration[2]

Code	Title	Units
Lower-Division Requirements		
EGR 1003 and EGR 1003L	Introduction to Engineering I and Introduction to Engineering I Lab	3
EGR 1023 and EGR 1023L	Introduction to Engineering II and Introduction to Engineering II Lab	3
EGR 1043 and EGR 1043L	Introduction to Computer Programming and Introduction to Computer Programming Lab	3
EGR 2014 and EGR 2014L	Engineering Mechanics: Statics and Engineering Mechanics: Statics Lab	4
EGR 2024 and EGR 2024L	Circuit Analysis and Circuit Analysis Lab	4
MTH 1064 and MTH 1064L	Calculus I (GE) and Calculus I Lab (GE)	4
MTH 1074 and MTH 1074L	Calculus II and Calculus II Lab	4

Code	Title	Units
MTH 2074	Calculus III	4
PHY 2044 and PHY 2044L	University Physics I (GE) and University Physics I Lab (GE)	4
PHY 2054 and PHY 2054L	University Physics II and University Physics II Lab	4
Upper-Division Requirements		
EGR 3003	Python and UNIX	3
EGR 3034 and EGR 3034L	Mechanics of Materials and Mechanics of Materials Lab	4
EGR 3043	Analytical Mechanics: Dynamics	3
EGR 3113	Measurement and Instrumentation	3
EGR 3123 and EGR 3123L	Mechanical Engineering Applications and Mechanical Engineering Applications Lab	3
EGR 4013	Thermodynamics	3
EGR 4043 and EGR 4043L	Embedded Systems and Robotics and Embedded Systems and Robotics Lab	3
EGR 4063	Solid State Engineering	3
EGR 4072	Senior Project I	2
EGR 4082	Senior Project II	2
EGR 4092	Internship in Engineering	2
MTH 3033	Differential Equations	3
PHY 3003 and PHY 3003L	Modern Physics and Modern Physics Lab	3
MTH 3063 or MTH 3083	Calculus Based Statistics with R Mathematical Probability and Statistics	3
Total Units		**77**

[1] Recommended Courses for Computer Engineering Concentration: EGR 4043/EGR 4043L and MTH 3043.

[2] Recommended Courses for Mechanical Engineering - Physics Concentration: CHE 1052/CHE 1052L and MTH 2033.