

College of Engineering

Academic Program Student Learning Outcomes

Program Description	Program Degree	Student Learning Outcomes
BIOENGINEERING	BSBE	An ability to identify, formulate and solve complex problems in engineering 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
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions.
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
BIOENGINEERING	MSBE	1: Demonstrate mastery of advanced knowledge in Bioengineering as required for the chosen area of professional specialization
		2: Understand, critically evaluate, and apply appropriate Bioengineering principles to solve engineering problems
BIOENGINEERING	PHD	1: Develop and evaluate new, advanced technical knowledge in a specialized area of Bioengineering.
		2: Understand, critically evaluate, and apply appropriate Bioengineering principles to solve engineering problems.
		3: Ability to design and conduct advanced experiments, as well as analyze and interpret data from these experiments
CIVIL ENGINEERING	BSCE	An ability to identify, formulate and solve complex problems in engineering 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.
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions.
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
CIVIL ENGINEERING	MSCE	Graduates' ability to master professional oral and written communications skills.

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Program Description	Program Degree	Student Learning Outcomes
CIVIL ENGINEERING (CONT'D)	MSCE (CONT'D)	Graduates to have a solid core knowledge in science, engineering and math, specialized in a chosen field of study.
CIVIL ENGINEERING	PHD	<p>Graduates' ability to master professional oral and written communications skills.</p> <p>Graduates will have a solid core knowledge in science, engineering and math, specialized in a chosen field of study.</p> <p>Graduates' ability to adapt to interdisciplinary research projects and employ emerging technology.</p> <p>Graduates' ability to plan, develop and conduct a research project on their own as future principal investigators</p>
COMPUTER AND SYSTEMS SECURITY	GRAD	<p>Demonstrate mastery of advanced knowledge in Electrical and Computer Engineering required for the profession.</p> <p>Understand, critically evaluate, and apply appropriate Electrical and Computer Engineering principles to solve engineering problems.</p> <p>Be able to conduct scholarly or professional activities in an ethical manner.</p>
COMPUTER SYSTEMS AND SECURITY	PSM	<p>Innovative problem solvers</p> <p>Interdisciplinary in engineering, science, technology, business, ethics, and policies</p> <p>Effective communicator</p>
CONSTRUCTION ENGINEERING TECHNOLOGY	BSCE	<p>a. an ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities;</p> <p>b. an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies;</p> <p>c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes;</p> <p>d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives;</p> <p>e. an ability to function effectively as a member or leader on a technical team;</p> <p>f. an ability to identify, analyze, and solve broadly-defined engineering technology problems;</p> <p>g. an ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;</p> <p>h. an understanding of the need for and an ability to engage in self-directed continuing professional development;</p> <p>i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity;</p> <p>j. a knowledge of the impact of engineering technology solutions in a societal and global context; and</p>

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CONSTRUCTION ENGINEERING TECHNOLOGY (CONT'D)	BSCE (CONT'D)	k. a commitment to quality, timeliness, and continuous improvement.
ELECTRICAL ENGINEERING	BSEE	An ability to identify, formulate and solve complex problems in engineering 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
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
ELECTRICAL ENGINEERING	MSEE	Demonstrate mastery of advanced knowledge in Electrical and Computer Engineering required for the profession.
		Understand, critically evaluate, and apply appropriate Electrical and Computer Engineering principles to solve engineering problems.
ELECTRICAL ENGINEERING	PHD	Demonstrate mastery of advanced knowledge in Electrical and Computer Engineering required for the profession.
		Understand, critically evaluate, and apply appropriate Electrical and Computer Engineering principles to solve engineering problems.
ENGINEERING	BSEN	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
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
		An ability to identify, formulate and solve complex problems in engineering by applying principles of engineering, science and mathematics

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Program Description	Program Degree	Student Learning Outcomes
ENGINEERING MANAGEMENT	GRAD	Be ready to facilitate group processes? (Plan, motivate, manage conflict)
ENGINEERING MANAGEMENT	MS	Understand and effectively utilize the skills to facilitate group processes. Plan, motivate, manage conflict and otherwise lead engineering teams to accomplish significant technological goals.1,2,3 Conceptualize, develop, and bring to market valuable new products?
ENGINEERING TECHNOLOGY	BSET	an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline [includes prior ABET/ETAC Student Outcomes (a), (b), and (f)] an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline [includes prior ABET/ETAC Student Outcomes (d), (i), and (j)] an ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature [formerly ABET/ETAC Student Outcome (g)] an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes [formerly ABET/ETAC Student Outcome (c)] an ability to function effectively as a member as well as a leader on technical teams [formerly ABET/ETAC Student Outcome (e)]
ENGINEERING TECHNOLOGY MANAGEMENT	METM	Understand and effectively utilize management and innovation tools that are used to conceptualize, develop, and bring to market valuable new products and services in the context of an existing organization.2.3 Understand and effectively utilize the skills to facilitate group processes. Plan, motivate, manage conflict and otherwise lead engineering teams to accomplish significant technological goals. 1,2,3
ENVIRONMENTAL ENGINEERING	BSEN	An ability to identify, formulate and solve complex problems in engineering 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 An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
ENVIRONMENTAL ENGINEERING	MSEN	Graduates to have a solid core knowledge in science, engineering and math, specialized in a chosen field of study.

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ENVIRONMENTAL ENGINEERING (CONT'D)	MSEN (CONT'D)	Graduates' ability to master professional oral and written communications skills.
ENVIRONMENTAL ENGINEERING	PHD	Graduates to have a solid core knowledge in science, engineering and math, specialized in a chosen field of study.
		Graduates' ability to plan, develop and conduct a research project on their own as future principal investigators
		Graduates' ability to adapt to interdisciplinary research projects and employ emerging technology.
		Graduates' ability to master professional oral and written communications skills.
INDUSTRIAL AND SYSTEMS ENGINEERING	BSIS	An ability to identify, formulate and solve complex problems in engineering 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
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
MECHANICAL ENGINEERING	BSME	An ability to identify, formulate and solve complex problems in engineering 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.
		An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments which consider the impact of engineering solutions in global, environmental, and social 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 judgement to draw conclusions.
		An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
MECHANICAL ENGINEERING	MSME	1: Demonstrate mastery of advanced knowledge in Mechanical Engineering required for the profession.

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Program Description	Program Degree	Student Learning Outcomes
MECHANICAL ENGINEERING (CONT'D)	MSME (CONT'D)	2: Understand, critically evaluate, and apply appropriate Mechanical Engineering principles to solve engineering problems. 3: Be able to conduct scholarly or professional activities in an ethical manner.
MECHANICAL ENGINEERING	PHD	1: Develop and evaluate new, advanced technical knowledge in a specialized area of Mechanical Engineering. 2: Understand, critically evaluate, and apply appropriate engineering principles to solve engineering problems. 3: Be able to conduct scholarly or professional activities in an ethical manner.
STORM WATER MANAGEMENT	GRAD	A basic understanding of the impacts of urban stormwater runoff on stream channel morphology and ecology and the Best Management Practices available to control both the quantity and quality of that runoff. A basic understanding of urban stream hydrology A basic understanding of the impact of stormwater on water quality and how to reduce this impact