

College of Engineering

Academic Program Student Learning Outcomes

Program Description	Program Degree	Student Learning Outcomes
BIOENGINEERING	BSBE	1: a. an ability to apply knowledge of mathematics, science and engineering 2: b. an ability to design and conduct experiments, as well as to analyze and interpret data 3: c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability 4: d. an ability to function on multidisciplinary teams 5: e. an ability to identify, formulate, and solve engineering problems 6: f. an understanding of professional and ethical responsibility 7: g. an ability to communicate effectively (3g1 orally, 3g2 written) 8: h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context 9: i. a recognition of the need for, and an ability to engage in life-long learning 10: j. a knowledge of contemporary issues 11: k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
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	1: a. an ability to apply knowledge of mathematics, science and engineering 2: b. an ability to design and conduct experiments, as well as to analyze and interpret data

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CIVIL ENGINEERING (CONT'D)	BSCE (CONT'D)	3: c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
		4: d. an ability to function on multidisciplinary teams
		5: e. an ability to identify, formulate, and solve engineering problems
		6: f. an understanding of professional and ethical responsibility
		7: g. an ability to communicate effectively (3g1 orally, 3g2 written)
		8: h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
		9: i. a recognition of the need for, and an ability to engage in life-long learning
		10: j. a knowledge of contemporary issues
		11: k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
		CIVIL ENGINEERING
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	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.
		Be able to conduct scholarly or professional activities in an ethical manner.
COMPUTER SYSTEMS AND SECURITY	PSM	Innovative problem solvers

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COMPUTER SYSTEMS AND SECURITY (CONT'D)	PSM (CONT'D)	<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> <p>k. a commitment to quality, timeliness, and continuous improvement.</p>
ELECTRICAL ENGINEERING	BSEE	<p>1: a. an ability to apply knowledge of mathematics, science and engineering</p> <p>2: b. an ability to design and conduct experiments, as well as to analyze and interpret data</p> <p>3: c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability</p>

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ELECTRICAL ENGINEERING (CONT'D)	BSEE (CONT'D)	4: d. an ability to function on multidisciplinary teams
		5: e. an ability to identify, formulate, and solve engineering problems
		6: f. an understanding of professional and ethical responsibility
		7: g. an ability to communicate effectively
		8: h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
		9: i. a recognition of the need for, and an ability to engage in life-long learning
		10: j. a knowledge of contemporary issues
		11: k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
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	1: a. an ability to apply knowledge of mathematics, science and engineering
		2: b. an ability to design and conduct experiments, as well as to analyze and interpret data
		3: c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
		4: d. an ability to function on multidisciplinary teams
		5: e. an ability to identify, formulate, and solve engineering problems
		6: f. an understanding of professional and ethical responsibility
		7: g. an ability to communicate orally and in writing effectively
		8: h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

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ENGINEERING (CONT'D)	BSEN (CONT'D)	9: i. a recognition of the need for, and an ability to engage in life-long learning 10: j. a knowledge of contemporary issues 11: k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
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	1: a. an ability to select and apply knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities 2: b. 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 3: c. Ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes 4: d. an ability to design systems, components, or processes for broadly-defined engineering technology problems appropriate to program educational objectives 5: e. an ability to function effectively as a member or leader on a technical team 6: f. an ability to identify, analyze, and solve broadly-defined engineering technology problems 7: 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 8: h. an understanding of the need for and an ability to engage in self-directed continuing professional development 9: i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity 10: j. a knowledge of the impact of engineering technology solutions in a societal and global context

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ENGINEERING TECHNOLOGY (CONT'D)	BSET (CONT'D)	11: k. a commitment to quality, timeliness, and continuous improvement
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	1: (a) an ability to apply knowledge of mathematics, science, and engineering
		2: b. an ability to design and conduct experiments, as well as to analyze and interpret data
		3: (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
		4: (d) an ability to function on multidisciplinary teams
		5: e) an ability to identify, formulate, and solve engineering problems
		6: (f) an understanding of professional and ethical responsibility
		7: (g) an ability to communicate effectively
		8: (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
		9: (i) a recognition of the need for, and an ability to engage in life-long learning
		10: (j) a knowledge of contemporary issues
		11: (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
ENVIRONMENTAL ENGINEERING	MSEN	Graduates to have a solid core knowledge in science, engineering and math, specialized in a chosen field of study.
		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

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ENVIRONMENTAL ENGINEERING (CONT'D)	PHD (CONT'D)	Graduates' ability to adapt to interdisciplinary research projects and employ emerging technology.
		Graduates' ability to master professional oral and written communications skills.
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 judgements 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: (a) Demonstrate mastery of advanced knowledge in Mechanical Engineering required for the profession.
		2: (b) Understand, critically evaluate, and apply appropriate Mechanical Engineering principles to solve engineering problems.
		3: (c) 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.

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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