

Graduate Attribute	Program Indicator*
<p>1. A knowledge base for engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.</p>	1a Demonstrate understanding of concepts in mathematics.
	1b Demonstrate understanding of concepts in natural science.
	1c Demonstrate understanding of engineering fundamentals.
	1d Demonstrate understanding of specialized engineering knowledge.
<p>2. Problem Analysis: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.</p>	2a Formulate a problem statement.
	2b Develop models to solve engineering problems including identifying approximations, assumptions and constraints.
	2c Critically evaluate solutions of engineering problems.
<p>3. Investigation: An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.</p>	3a Create investigative studies of complex engineering problems.
	3b Gather information from relevant sources to address complex engineering problems.
	3c Synthesize information from multiple sources to reach valid conclusions.
<p>4. Design: An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, economic, environmental, cultural and societal considerations.</p>	4a Define design requirements and specifications for complex, open-ended engineering problems.
	4b Critically evaluate and compare design choices.
	4c Generate and refine potential solutions to complex, open-ended design problems.
	4d Communicate design solutions and processes.
<p>5. Use of Engineering Tools: An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.</p>	5a Select appropriate engineering tools, considering their limitations.
	5b Modify and/or create appropriate engineering tools, identifying their limitations.
	5c Use engineering tools appropriately.
<p>6. Individual and Team Work: An ability to work effectively as a member and as a leader in teams, preferably in a multi-disciplinary setting.</p>	6a Contribute as an active team member or leader to complete individual tasks.
	6b Collaborate with others to complete tasks effectively as a team.
<p>7. Communication skills: An ability to communicate complex engineering concepts within the profession and with society at large. Such abilities include reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.</p>	7a Orally present information within the profession and to society at large.
	7b Communicate in a written format within the profession and to society at large.
	7c Interpret information, including instructions.
<p>8. Professionalism: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.</p>	8a Articulate the roles and responsibilities of the professional engineer in society with reference to the protection of the public and its interest.
	8b Describe the importance of codes, standards, best practices, laws, and regulations within engineering.
<p>9. Impact of Engineering: An ability to analyze social and environmental aspects of engineering activities. Such abilities include an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society; the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.</p>	9a Identify the relevance of and uncertainty associated with the different aspects (social, cultural, economic, health, safety, legal, environmental), of an engineering project.
	9b Analyze the social, health, safety, and environmental aspects of an engineering project, incorporating sustainability considerations and environmental stewardship in making decisions.
<p>10. Ethics & Equity: An ability to apply professional ethics, accountability, and equity.</p>	10a Identify ethical and unethical behavior in professional situations.
	10b Identify how an engineer is accountable to multiple stakeholders in engineering practice.
	10c Identify equitable and inequitable situations or behaviors.
<p>11. Economics & Project Management: An ability to appropriately incorporate economics and business practices including project, risk and change management into the practice of engineering, and to understand their limitations.</p>	11a Apply project management techniques and other business practices in engineering projects, with attention to risk and change.
	11b Perform economic analyses of engineering projects with attention to uncertainty and limitations.
<p>12. Life-long Learning: An ability to identify and to address their own educational needs in a changing world to sufficiently maintain their competence and contribute to the advancement of knowledge.</p>	12a Identify gaps in their knowledge, skills and abilities.
	12b Obtain and evaluate information or training from appropriate sources.
	12c Reflect on the use of information or training received.

*Note that program indicators are the level a student should get to. In some instances the introductory level may not match the indicator precisely. For example there are many courses where a student selects an appropriate equation (model) to solve a problem. In this instance the student is not developing the model, but identifying an appropriate equation (model) can be considered an introductory step to ultimately being able to develop a model.