

Attribute	Performance indicators
Knowledge Base	("_____ graduates from UWaterloo should be able to...")
	<p>1a. <b>Demonstrate</b> understanding of concepts in mathematics</p> <p>1b. <b>Demonstrate</b> understanding of concepts in natural science</p> <p>1c. <b>Demonstrate</b> understanding of engineering fundamentals</p> <p>1d. <b>Demonstrate</b> understanding of specialized engineering knowledge</p>
Problem Analysis	<p>2a. <b>Formulate</b> a problem statement</p> <p>2b. <b>Develop</b> models to <b>solve</b> engineering problems including identifying approximations, assumptions and constraints</p> <p>2c. <b>Critically evaluate</b> solutions of engineering problems<sup>1</sup></p>
Investigation	<p>3a <b>Design</b><sup>2</sup> experiments to <b>investigate</b> complex engineering problems</p> <p>3b. <b>Gather</b> information from relevant sources<sup>3</sup> to address complex engineering problems</p> <p>3c. <b>Synthesize</b> information from multiple sources to reach to reach valid conclusions</p>
Design <sup>4</sup>	<p>4a. <b>Define</b> design requirements and specifications for complex, open-ended engineering problems<sup>5</sup></p> <p>4b. Critically <b>evaluate</b> and <b>compare</b> design choices</p> <p>4c. <b>Generate</b> and <b>refine</b> potential solutions to complex, open-ended design problems</p>
Use of Engineering Tools	<p>5a. <b>Select</b> appropriate engineering tools<sup>6</sup>, <b>considering</b> their limitations</p> <p>5b. <b>Modify</b> and/or <b>create</b> appropriate engineering tools, <b>identifying</b> their limitations</p> <p>5c. <b>Use</b> engineering tools appropriately</p>
Individual and Team Work	<p>6a. <b>Contribute</b> as an active team member or leader to complete individual tasks</p> <p>6b. <b>Collaborate</b> with others to complete tasks effectively as a team</p>
Communication skills	<p>7a. Orally <b>present</b> information within the profession and to society at large</p> <p>7b. <b>Communicate</b> in a written format within the profession and to society at large</p> <p>7c. <b>Interpret</b> information, including instructions</p>
Professionalism	<p>8a. <b>Articulate</b> the roles and responsibilities of the professional engineer in society with reference to the <b>protection</b> of the public and its interest.</p> <p>8b. <b>Describe</b> the importance of codes, standards, best practices, laws, and regulations within engineering.</p>
Impact of Engineering	<p>9a. <b>Identify</b> the relevance of and uncertainty associated with the different aspects (social, cultural, economic, health, safety, legal, environmental), of an engineering project.</p> <p>9b. <b>Analyze</b> the social, health, safety, and environmental aspects of an engineering project, incorporating sustainability considerations in making decisions.</p>
Ethics & Equity	<p>10a. <b>Identify</b> ethical and unethical behavior in professional situations</p> <p>10b. <b>Identify</b> how an engineer is accountable to multiple stakeholders in engineering practice.</p> <p>10c. <b>Identify</b> equitable and inequitable situations or behaviors</p>
Economics & Project Management	<p>11a. <b>Apply</b> project management techniques in engineering projects, with attention to risk and change.</p> <p>11b. <b>Perform</b> economic analyses of engineering projects with attention to uncertainty and limitations.</p>
Life-long Learning	<p>12a. <b>Identify</b> gaps in their knowledge, skills and abilities</p> <p>12b. <b>Obtain</b> and <b>evaluate</b> information or training from appropriate sources</p> <p>12c. <b>Reflect</b> on the use of information or training received</p>

<sup>1</sup> Note: the words 'reality checks' and 'complex' need to be included in the rubrics

<sup>2</sup> Identifying factors that affect a system, and planning experiments to determine their relationships

<sup>3</sup> Experiments, field data, literature, and other sources

<sup>4</sup> The design process is iterative and may require going back and forth between any of these indicators

<sup>5</sup> Including health and safety risks, applicable standards, economic, environmental, cultural, and societal considerations as appropriate

<sup>6</sup> 'Tools' is defined broadly, to include physical tools and to also include software, hardware, techniques (e.g. factorial design, dimensional analysis)