# University of Guelph, School of Engineering

## Graduate Attribute Indicator Statements – Approved May 18, 2018

## 1. Knowledge Base

- 1.1.18 Recall, describe and apply fundamental mathematical principles and concepts
- 1.2.18 Recall, describe and apply fundamental principles and concepts in natural science
- 1.3.18 Recall, describe and apply fundamental engineering principles and concepts
- 1.4.18 Recall, describe and apply program-specific engineering principles and concepts

## 2. Problem Analysis

- 2.1.18 Formulate a problem statement in engineering and non-engineering terminology
- 2.2.18 Identify, organize and justify appropriate information, including assumptions
- 2.3.18 Construct a conceptual framework and select an appropriate solution approach
- 2.4.18 Execute an engineering solution
- 2.5.18 Critique and appraise solution approach and results

# 3. Investigation

- 3.1.18 Propose a working hypothesis
- 3.2.18 Design and apply an experimental plan/investigative approach (for example, to characterize, test or troubleshoot a system)
- 3.3.18 Analyze and interpret experimental data
- 3.4.18 Assess validity of conclusions within limitations of data and methodologies

### 4. Design

- 4.1.18 Describe design process used to develop design solution
- 4.2.18 Construct design-specific problem statements including the definition of criteria and constraints
- 4.3.18 Create a variety of engineering design solutions
- 4.4.18 Evaluate alternative design solutions based on problem definition
- 4.5.18 Develop and refine an engineering design solution, through techniques such as iteration, simulation and/or prototyping

## 5. Use of Engineering Tools

- 5.1.18 Select appropriate engineering tools from various alternatives
- 5.2.18 Demonstrate proficiency in the application of selected engineering tools
- 5.3.18 Recognize limitations of selected engineering tools

#### 6. Individual & Teamwork

- 6.1.18 Describe principles of team dynamics and leadership
- 6.2.18 Understand all members' roles and responsibilities within a team
- 6.3.18 Execute and adapt individual role to promote team success through, for example, timeliness, respect, positive attitude
- 6.4.18 Apply strategies to mitigate and/or resolve conflicts
- 6.5.18 Demonstrate leadership through, for example, influencing team vision and process, promoting a positive team culture, and inspiring team members to excel

#### 7. Communication Skills

- 7.1.18 Identify key message(s) and intended audience in verbal or written communication as both sender and receiver
- 7.2.18 Interpret technical documentation such as device specification sheets, drawings, diagrams, flowcharts, and pseudocode
- 7.3.18 Construct the finished elements using accepted norms in English, graphical standards, and engineering conventions, as appropriate for the message and audience
- 7.4.18 Substantiate claims by building evidence-based arguments and integrating effective figures, tables, equations, and/or references
- 7.5.18 Demonstrate ability to process oral and written communication by following instructions, actively listening, incorporating feedback, and formulating meaningful questions

#### 8. Professionalism

- 8.1.18 Demonstrate an understanding of what it means to be a professional engineer and distinguish between legislated and non-legislated professions
- 8.2.18 Effectively describe engineering law and its impact on professional engineering practice
- 8.3.18 Demonstrate professional behaviour
- 9. Impact of Engineering on Society and the Environment
- 9.1.18 Analyze the safety, social, environmental, and legal aspects of engineering activity
- 9.2.18 Evaluate the uncertainties and risks associated with engineering activities
- 9.3.18 Anticipate the positive and negative impacts of introducing innovative technologies to solve engineering problems

#### 10. Ethics & Equity

- 10.1.18 Summarize ethical theories and equity, diversity, and inclusivity principles
- 10.2.18 Determine an ethical course of action by applying ethical theories and the PEO Code of Ethics

- 10.3.18 Demonstrate values consistent with good ethical practice, including equity, diversity, and inclusivity
- 11. Economics and Project Management
- 11.1.18 Apply project management techniques and manage resources within identified constraints
- 11.2.18 Identify risk and change management techniques, in the context of effective project management
- 11.3.18 Estimate economic impact and feasibility of an engineering project or design using techniques such as cost benefit analysis over the life of the project or design
- 12. Life Long Learning
- 12.1.18 Identify personal career goals and opportunities for professional development
- 12.2.18 Self-assess skills relative to career goals and SOE defined learning outcomes
- 12.3.18 Demonstrate capability for continuous knowledge and skill development in a changing world