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