Graduate Attribute Indicators

SMITH ENGINEERING
Queen's University

[1]Established, current and/or emerging frameworks (e.g. models, methodologies, processes) [PA-Formulate]
[2]Numerical, experimental, literature and/or field investigations. [IN-Conduct, IN-Synthesis]
[3]Collect, organize, clean, process, analyze, and communicate data. [IN-Analysis]
[4]Shop, field and/or laboratory work environments.
[5]With appropriate attention to health, safety, environmental, economic, regulatory, cultural, societal and stakeholder needs. [DE-Define, SE-Solutions, DE-Assess]
[6]Demonstrating inclusive leadership, by being a good listener, motivating the team, staying open to input, facilitating dialogue, etc. [TW-Leadership]
[7]Technical elements, resolving conflict, developing good relationships between team members, organization, delegation, communications, etc.
[8]Communications from instructors, textbooks, classmates, and clients. [CO-Interpretation]

1. KNOWLEDGE BASE (KB)

KB - Mathematics - Demonstrate competence in university-level mathematics.

KB - Natural Science - Interpret natural phenomena and relationships through the use of analytical and/or experimental techniques.

KB - Engineering Science - Apply mathematics, natural science and engineering science to engineering problems.

2. PROBLEM ANALYSIS (PA)

PA - Identify - Characterize complex engineering problems.

PA - Formulate - Develop appropriate frameworks[1] for solving complex engineering problems.

PA - Solve - Implement solutions for complex engineering problems.

PA - Evaluate - Analyze solutions to complex engineering problems to draw conclusions.

3. INVESTIGATION (IN)

IN - Conduct - Conduct investigations[2] to test hypotheses related to complex problems.

IN - Analysis - Analyze[3] and interpret data using appropriate techniques and tools.

IN - Synthesis - Synthesize information from investigations[2], considering sources of uncertainty and limitations to reach substantiated conclusions.

IN - Safety - Adhere to appropriate workplace safety protocols in all work[4] environments.

4. DESIGN (DE)

DE - Define - Define problem, objectives and constraints[5].

DE - Strategies - Compare multiple strategies for solving a problem.

DE - Solutions - Create a product, process or system to solve a problem, that meets specified needs[5], and subject to appropriate iterations.

DE - Assess - Evaluate performance of a design, using criteria that incorporates specifications, limitations, assumptions, constraints[5], and other relevant factors.

5. USE OF ENGINEERING TOOLS (ET)

ET - Create - Develop, adapt and/or extend appropriate software, equipment, models, and simulations for a range of engineering activities.

ET - Apply - Apply and manage appropriate techniques, apparatus, databases, models, tools, and/or processes to accomplish a task.

ET - Limitations - Evaluate limitations and errors of instrumentation/measurement/ techniques/models/simulations to assess appropriateness of the results.

6. INDIVIDUAL & TEAM WORK (TW)

TW - Contribution - Take initiative to plan, organize and complete tasks, as an individual and team member, in order to meet goals.

TW - Diversity - Seek and integrate diverse and alternative perspectives in decision-making.

TW - Inclusive Leadership - Demonstrate inclusive leadership by demonstrating individual accountability and responsibility, being a good listener, motivating the team, staying open to input, and valuing other's perspectives.

TW - Feedback - Share ideas and information by eliciting, giving and applying positive and effective feedback.

June, 2024

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7. COMMUNICATION SKILLS (CO)

CO - Written - Produce clear, concise, precise and well-organized written communication with language appropriate for the audience.

CO - Spoken - Deliver formal and informal oral presentations with suitable language, content, style, timing and flow, while adapting format, content and tone to audience and purpose.

CO - Graphics - Create figures, maps, tables and drawings to engineering report standards.

CO - Interpretation - Interpret communication from a variety of sources[8] and respond to instructions and questions, displaying full understanding of the topic.

CO - Documentation - Generate a traceable and defensible record of a technical project using an appropriate records system.

8. PROFESSIONALISM (PR)

PR - Regulations - Recognize that engineering is a regulated profession dedicated to serve and protect the public interest.

PR - Standards - Integrate appropriate standards, codes, legal and regulatory factors into decision making.

PR - Interpersonal - Demonstrate professional conduct and integrity.

9. IMPACT OF ENGINEERING ON SOCIETY & THE ENVIRONMENT (IM)

IM - Environment - Evaluate the environmental impact of engineering activities and promote environmental stewardship of the natural and built environments through engagement with local communities, including Indigenous perspectives when applicable.

IM - Mitigate - Take appropriate action to mitigate risks associated with economic, health, safety and legal aspects of engineering activities.

IM - Social - Evaluate cultural, societal, and technical norms that recognize relevant stakeholder perspectives, including Indigenous where relevant, maintaining ethical position required for engineering practice in Canada.

IM - Sustainability - Incorporate sustainability concepts into engineering activities, aimed at addressing global climate change goals when applicable.

10. ETHICS & EQUITY (EE)

EE - Ethics - Identify and resolve potential ethical issues using ethical principles and codes, demonstrating knowledge of professional accountability in engineering.

EE - Equity - Intentionally incorporate principles of fairness, access and opportunity into decision making.

EE - AI - Demonstrate adherence to academic integrity principles.

11. ECONOMICS & PROJECT MANAGEMENT (EC)

EC - Economics - Apply economic considerations, such as capital, operating, societal and life cycle costs, to design processes.

EC - Management - Effectively plan projects, including mitigating risk and managing change, to complete project on-time and on-budget.

12. LIFE-LONG LEARNING (LL)

LL - Reflection - Evaluate and reflect on own knowledge, skills and learning.

LL - Acquisition - Independently acquire new knowledge and skills for ongoing personal and professional development.

LL - Information - Identify, organize, and critically evaluate information from an appropriate range of sources, to meet learning needs.

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