

**Graduate attribute # 3 Investigation****Canadian Engineering Accreditation Board definition:**

*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.*

**Indicators:**

The genesis of the Attribute Indicators for measuring graduate attributes for the Program lies in Mechanical Engineering. Before creation of the Department of Civil Engineering, the Civil Engineering Program was hosted by the Department of Mechanical Engineering. This was pragmatic, since the Civil Program has some overlap with the Mechanical Program (e.g., courses in Fluid Mechanics, Mechanics of Solids, and Dynamics); that is in addition to sharing a common first year and second year math courses. Consequentially, the structure of the Indicators for the Civil Program was adapted from the Mechanical Engineering Program.

The indicators are:

- 3a) Demonstrate the ability to identify complex questions that are key to developing solutions for open-ended real-world problems and formulate these questions as engineering problems;
- 3b) Develop and execute experiments to inform the solution of an engineering problem;
- 3c) Analyse, interpret and synthesize experimental data to reach valid conclusions that inform the solution of an engineering problem.

**Assessment tools:**

The indicators of this attribute were assessed by instructors, co-op employers, and by students.

Instructor assessments were gathered from courses with learning outcomes that mapped to the indicators. The mapping was done by the Program Accreditation Team and the Accreditation Analyst. Instructors were free to assess the learning outcomes however they chose, and to choose how to bin the assessment results - ie, which ranges of results would correspond to Exceed expectations, Meets expectations, etc.

Co-op employer and student assessments were gathered from selected survey tools. The mapping from survey questions to indicators and the binning was done by the Accreditation Analyst.

The assessment tools for indicator (a) are shown in the table below.

<b>Course / Survey</b>	<b>Assessor</b>	<b>Level</b>	<b>Course learning outcome or Question</b>	<b>Method of assessment</b>
CIVE385	1:Instructor	D	Evaluate and implement a soil investigation program and perform soil classification analysis	Final grade

Exit	3:Student	D	To what extent do you demonstrate the following behaviour: Identify complex questions that are key to developing solutions for open-ended real-world problems and formulate these questions as engineering problems?	Online survey
CIVE340	1:Instructor	A	Discuss and appreciate the complexity of global water resource problems and solutions	Participation, Assignment 1
CIVE456	1:Instructor	A	Design an emerging material or specialized concrete mix;	Project and presentation
CIVE480A	1:Instructor	A	Evaluate and implement a Soil Investigation Program and perform Soil Classification Analyses	Final grade
CCAT-E	2:Employer	A	Comment on the student's performance and progress to date in Managing Information: Turns data into knowledge by identifying, gathering and managing information.	Online survey
LCES	2:Employer	A	To what extent does your student demonstrate the following behaviour: Identify complex questions that are key to developing solutions for open-ended real-world problems and formulate these questions as engineering problems?	Online survey
CCAT-S	3:Student	A	Self-assess your level of proficiency in Managing Information: Turns data into knowledge by identifying, gathering and managing information.	Online survey

**Graduate attribute # 7 Communication skills****Canadian Engineering Accreditation Board definition:**

*An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes 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.*

**Indicators:**

The genesis of the Attribute Indicators for measuring graduate attributes for the Program lies in Mechanical Engineering. Before creation of the Department of Civil Engineering, the Civil Engineering Program was hosted by the Department of Mechanical Engineering. This was pragmatic, since the Civil Program has some overlap with the Mechanical Program (e.g., courses in Fluid Mechanics, Mechanics of Solids, and Dynamics); that is in addition to sharing a common first year and second year math courses. Consequentially, the structure of the Indicators for the Civil Program was adapted from the Mechanical Engineering Program.

The indicators are:

7a) Demonstrate the ability to write and revise documents using discipline-specific formats and conventions for communication with colleagues and/or the general public.

7b) Demonstrate the ability to use effective oral communication in formal and informal settings with colleagues and/or the general public

7c) Demonstrate the ability to use technical graphics to explain, interpret, and assess information

**Assessment tools:**

The indicators of this attribute were assessed by instructors, co-op employers, and by students.

Instructor assessments were gathered from courses with learning outcomes that mapped to the indicators. The mapping was done by the Program Accreditation Team and the Accreditation Analyst. Instructors were free to assess the learning outcomes however they chose, and to choose how to bin the assessment results - ie, which ranges of results would correspond to Exceed expectations, Meets expectations, etc.

Co-op employer and student assessments were gathered from selected survey tools. The mapping from survey questions to indicators and the binning was done by the Accreditation Analyst.

The assessment tools for indicator (b) are shown in the table below.

Course / Survey	Assessor	Level	Course learning outcome or Question	Method of assessment
ENGR120	1:Instructor	I	prepare and deliver a professional presentation using appropriate visual aids	Presentation 1,2
CIVE220	1:Instructor	D	Develop interpersonal understanding, teamwork and communication skills	Lab 1, Lab 2

Exit	3:Student	D	To what extent do you demonstrate the following behaviour: Summarize complex engineering concepts in terms appropriate for communication to colleagues and/or the general public?	Online survey
ENGR120	1:Instructor	A	apply a problem-solving approach to a communication task, identifying the purpose, audience, and content, and developing an effective production plan	Report 2, 3
CCAT-E	2:Employer	A	Comment on the student's performance and progress to date in Communication: Understands, develops and uses a broad range of communication methods and styles that are appropriate for the situation and audience.	Online survey
LCES	2:Employer	A	To what extent does your student demonstrate the following behaviour: Summarize complex engineering concepts in terms appropriate for communication to colleagues and/or the general public?	Online survey
CCAT-S	3:Student	A	Self-assess your level of proficiency in Communication: Understands, develops and uses a broad range of communication methods and styles that are appropriate for the situation and audience.	Online survey