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CHANGING LIVES
IMPROVING LIFE

Alignment of Assessments, Course Learning Outcomes and Program Learning Outcomes


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Outline

- Introduction
- Constructive Alignment
- Engineering Accreditation Context
- Alignment Tool
- Alignment Activity

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Introduction

Clear Learning Outcomes

Measure student performance

Assess program quality

Need:

- Tools for faculty
- Student & faculty engagement

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Constructive Alignment

(Intended) Learning Outcomes

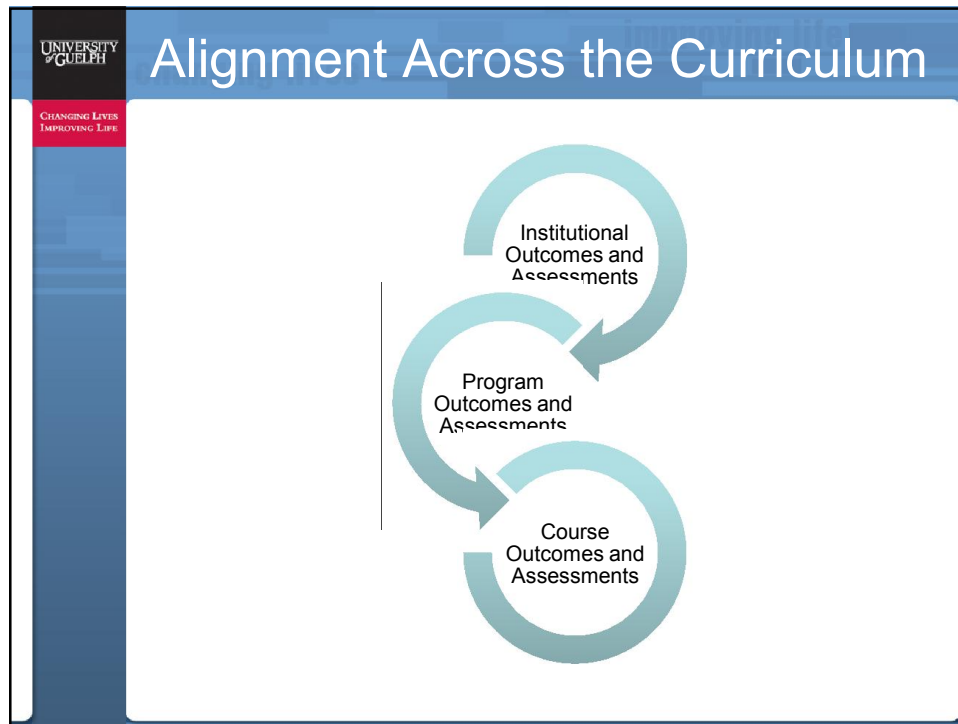
The diagram illustrates the Constructive Alignment model. At the top is the text "(Intended) Learning Outcomes". Below it is a teal triangle containing the text "Context", "Process", and "Content". From the top vertex of the triangle, two arrows point downwards and outwards to the text "Teaching and Learning Activities" on the left and "Feedback and Assessment Methods" on the right. A horizontal double-headed arrow connects "Teaching and Learning Activities" and "Feedback and Assessment Methods".

Teaching and Learning Activities

Feedback and Assessment Methods

Context
Process
Content

"... high level engagement ought not to be left to serendipity, or to individual student brilliance, but should be actively encouraged by the teacher." (Biggs, 1996, p. 353)



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Engineering Context

Engineering is a professional program

- All undergrad programs undergo accreditation
- Canadian Engineering Accreditation Board (CEAB)

Accreditation issues

- Data-informed curriculum improvement process
- CEAB defined 12 Graduate Attributes

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Engineering Context

*“There must be **processes** in place that demonstrate that **program outcomes** are being **assessed** in the context of the graduate attributes, and that the **results are applied** to the further development of the program.” **

**2013 Canadian Engineering Accreditation Board – Accreditation Criteria and Procedures*

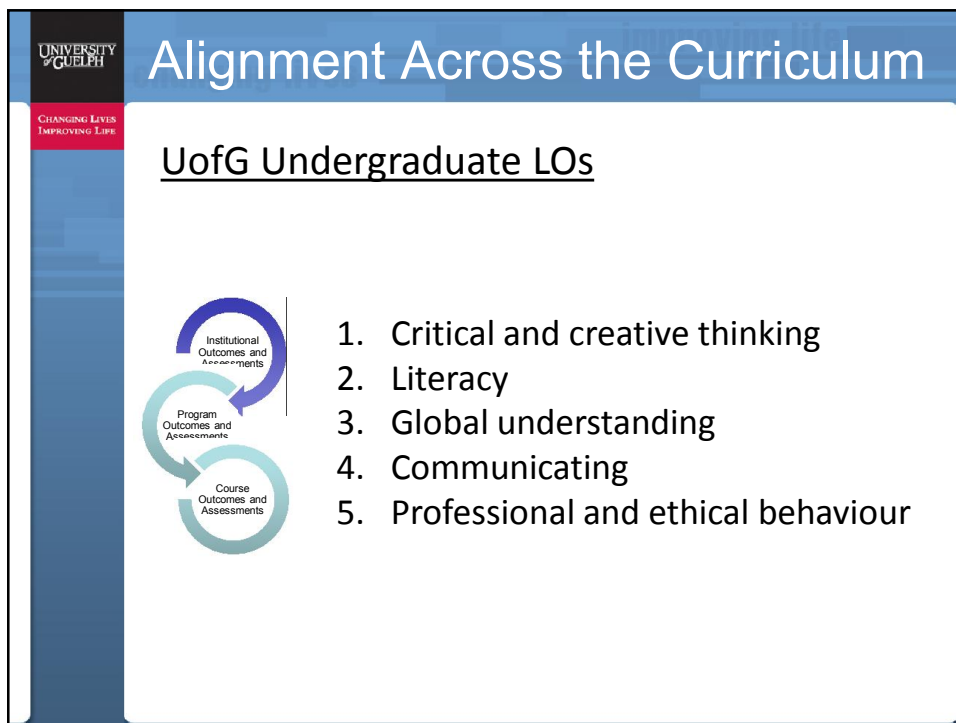
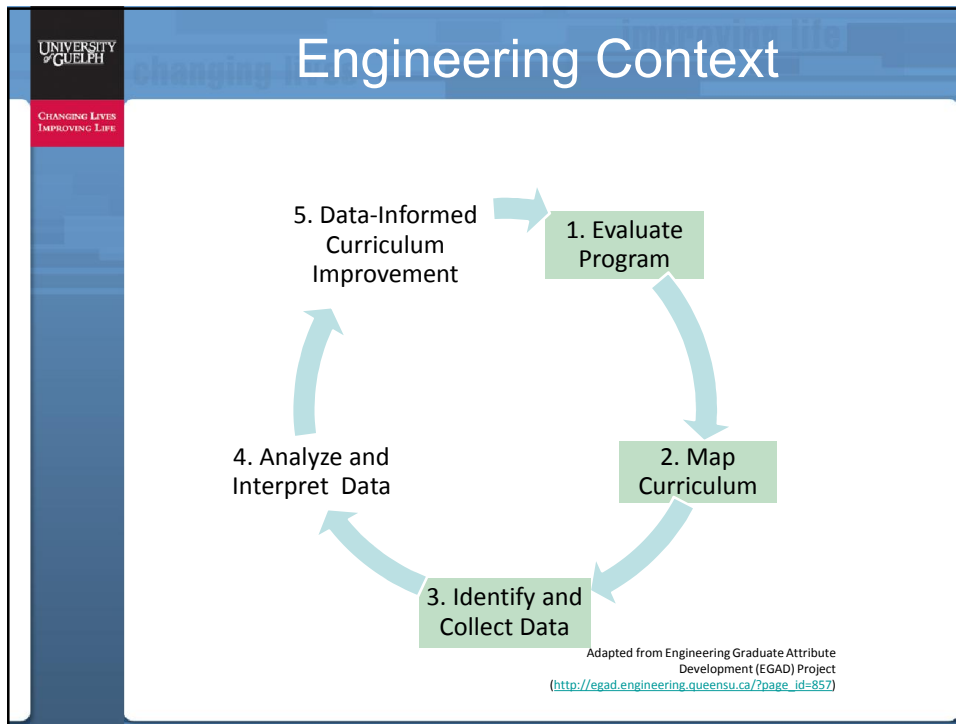
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Engineering Context

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graph TD
    1[1. Evaluate Program] --> 2[2. Map Curriculum]
    2 --> 3[3. Identify and Collect Data]
    3 --> 4[4. Analyze and Interpret Data]
    4 --> 5[5. Data-Informed Curriculum Improvement]
    5 --> 1
  
```


Adapted from Engineering Graduate Attribute Development (EGAD) Project
(http://egad.engineering.queensu.ca/?page_id=857)



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Alignment Across the Curriculum

Graduate Attributes



1. A knowledge base for engineering	7. Communication skills
2. Problem analysis	8. Professionalism
3. Investigation	9. Impact of engineering on society and the environment
4. Design	10. Ethics and equity
5. Use of engineering tools	11. Economics and project management
6. Individual and team work	12. Life-long learning

*2012 Canadian Engineering Accreditation Board – Accreditation Criteria and Procedures

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Alignment Across the Curriculum

Graduate Attribute 2 - PROBLEM ANALYSIS


An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions.*

*2013 Canadian Engineering Accreditation Board – Accreditation Criteria and Procedures

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Alignment Across the Curriculum

Course to Program Alignment



The diagram consists of three overlapping circles arranged in a vertical stack. The top circle is light blue and labeled 'Institutional Outcomes and Assessments'. The middle circle is a darker blue and labeled 'Program Outcomes and Assessments'. The bottom circle is purple and labeled 'Course Outcomes and Assessments'. Arrows indicate a flow from the top circle to the middle, and from the middle to the bottom.

Engage individual faculty

- Course LOs
- Map to program LOs
- Common course outline

Engage students


- Common course outline

HOW?


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Alignment Tool

A. Identify Course Learning Outcomes (CLOs)




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Alignment Tool

B. Relate Course Learning Outcomes to Assessments




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C. Identify Program Learning Outcomes (PLO or Graduate Attributes) that CLOs support




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Alignment Tool

D. Identify Specific Assessments that can be used to provide data for the PLO




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Alignment Tool

E. Identify the Level of Sophistication for the learning outcome with respect to Program Level expectations



Alignment Tool

F. Note any contextual information related to the assessment that will help interpret the data at a program level.



Alignment Activity

Resources

- Alignment Tool (the table!)
- Course outline excerpts
- Graduate Attributes with descriptions

Activity

- Select a course outcome
- Constructively align (fill in one row)

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Alignment Activity

Report Back

- Challenges you encountered?
- How might you apply in your course, department or institution?
- What would you change?

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Computer

Systems and Computing

Environmental

Biomedical

Biological

Mechanical

Water Resources