Implementing Competency Based Assessment in Engineering

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Land Acknowledgement

In Saskatoon, Saskatchewan, in the spirit of reconciliation, we recognize and acknowledge that the land on which we live and work is unceded Treaty 6 territory, traditional lands of the Cree, Saulteaux, Stony, Nakota, Dakota, and Lakota, and the homeland of the Métis.

In Kingston, Ontario, we acknowledge that Queen's is situated on traditional Anishinaabe and Haudenosaunee territory. We are grateful to be able to live, learn and play on these lands.

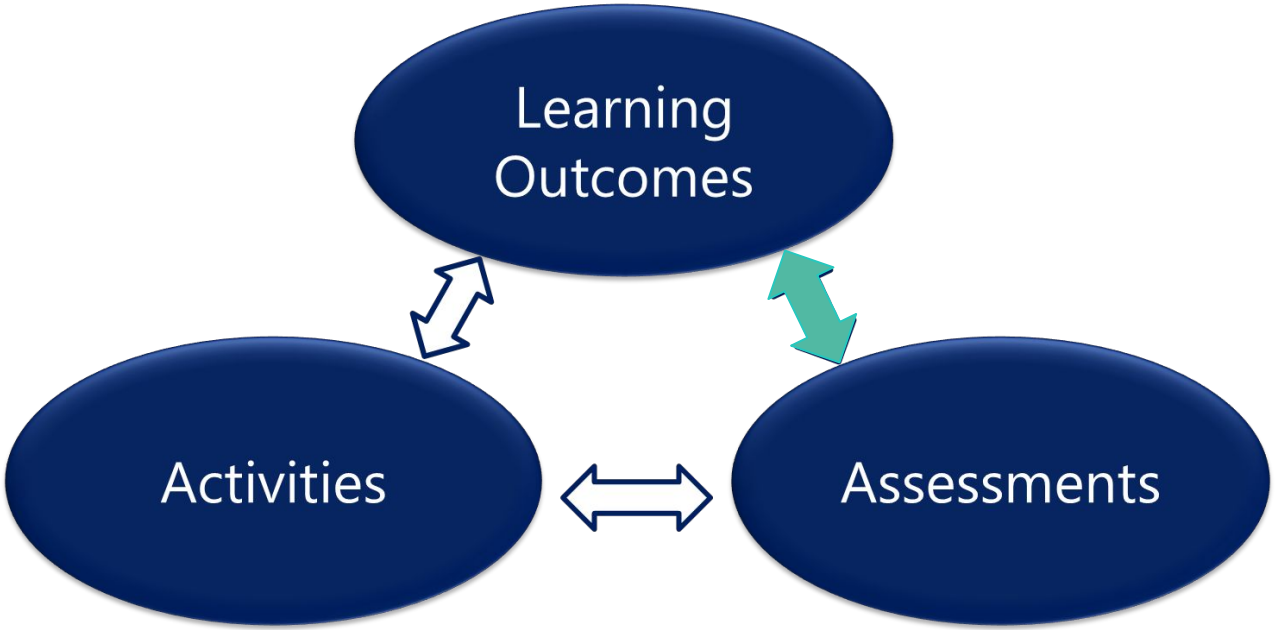
Workshop Learning Outcomes

By the end of this workshop, you will be able to:

1. Describe key elements of CBA
2. Evaluate how well assessment systems align with principles of CBA
3. Evaluate a course assessment plan for alignment with CBA

Constructive Alignment & CBA

Like peanut butter and jam. Ham and pineapple. Bacon and eggs.



Knowledge Pre-Check

Which of the following does **not** describe CBA:

(a) It benefits students by promoting autonomous learning.
(b) It supports constructive alignment between learning outcomes, assessment, and instructional activities.
(c) Students can move at their own pace and/or recover academically from poor early performance.
(d) It naturally uses fewer resources than traditional assessment approaches.
(e) Completion of a module/course requires demonstrating proficiency on learning outcomes.

A CBA Implementation Framework

Considerations
1. What are the learning outcomes (PLOs/CLOs/RLOs/SLOs)?
2. What are the difficulty levels and relative importances/weightings of CLOs/RLOs?
3. Determine performance levels required to complete/pass CLOs/RLOs
4. When and how many evaluation opportunities are offered, taking into account assessment feedback and instructional/tutorial support?
5. What is the requirement to complete the course i.e. which and/or how many CLOs/RLOs are required for completion?
6. How will students know about their performance relative to learning outcomes?

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- **Consideration 1: learning outcomes i.e. what do you want them to know & do?**
  - **start with a list of knowledge and skills (PLOs/RLOs), experiences & attitudes**

develop hypotheses

apply couples

identify and classify statics problems

calculate unknown forces in 2D/3D rigid body equilibrium problems

solve 2D trusses

add and subtract vectors

utilize dot products

express proper notation

calculate unknown forces in 2D/3D particle equilibrium problems

solve 2D frames and machines

draw 3D axes

draw conclusions

recognize, define, and use terms

calculate a moment

solve dry friction problems

calculate equivalent point loads

exhibit safe behaviour

frame solutions with Given, Find, Assumptions, and Conclusions

Example 1: Statics Course

- **then convert these ideas into proper Learning Outcomes e.g.**

"calculate a moment"

becomes

Action Verb **Content/Object** **Context**

calculate the moment created by a force about a point or an axis in 2D and 3D, using vector and scalar formulations

so if this becomes an RLO, what would be a possible SLO (sub-LO)?

Example 1: Statics Course

- **then form groups of sequences of RLOs from your new list e.g.**

add and subtract vectors using the parallelogram, triangle and Cartesian methods in order to solve basic vector problems

utilize dot products of 2D & 3D vectors to solve problems

apply 3D equations of equilibrium to calculate unknown forces in 3D particle equilibrium problems

recognize, define, and use terms relevant to 2D and 3D particle equilibrium; perform simple calculations relevant to 2D and 3D particle equilibrium

So if these 5 RLOs get bundled into a CLO, how would you order them?

apply 2D equations of equilibrium to calculate unknown forces in 2D particle equilibrium problems

Example 1: Statics Course

CLO 1 - Solve Particle Statics Problems

By the end of this module, students will be able/expected to:
1. recognize, define, and use terms relevant to 2D and 3D particle equilibrium; and perform simple calculations relevant to 2D and 3D particle equilibrium; 2. add and subtract vectors using the parallelogram, triangle and Cartesian methods in order to solve basic vector problems; 3. utilize dot products of 2D & 3D vectors in order to solve problems; 4. apply 2D equations of equilibrium to calculate unknown forces in 2D particle equilibrium problems; and 5. apply 3D equations of equilibrium to calculate unknown forces in 3D particle equilibrium problems.

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- **Consideration 2: decide what types of problems (levels of difficulty) are desirable with these RLOs, what levels of competence students must be able to demonstrate at these difficulty levels, and the relative importances of the RLOs**
  - **At the program level, recall that we came up with a classification of question-types (difficulty levels) and required competency thresholds**

Type A	**fundamental knowledge and skills that need to be automatized**
•	pass/fail, unlimited tries, automated evaluation
Type B	**basic fully integrated problems, characteristic of the field**
•	need at least 70% to pass module, multiple tries (3+), marked by TAs
Type B+	**typically writing/design assignments (results span the B/C range)**
•	need at least 50% to pass module, multiple tries (2+), marked by TAs/instructors
Type C	**"difficult" fully integrated problems; tough/tricky problems**
•	no minimum grade required, single chances, marked by instructors

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

CLO 1 - Solve Particle Statics Problems (25% of course grade)

By the end of this module, students will be expected to:	Weights
1. recognize, define, and use terms relevant to 2D and 3D particle equilibrium; and perform simple calculations relevant to 2D and 3D particle equilibrium (**Type A**);	**P/F**
2. add and subtract vectors using the parallelogram, triangle and Cartesian methods in order to solve basic vector problems (**Type B/C**);	**20%**
3. utilize dot products of 2D & 3D vectors in order to solve problems (**Type B/C**);	**15%**
4. apply 2D equations of equilibrium to calculate unknown forces in 2D particle equilibrium problems (**Type B/C**); and	**35%**
5. apply 3D equations of equilibrium to calculate unknown forces in 3D particle equilibrium problems (**Type B/C**).	**30%**

… and one last tricky bit

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

We want a student to get 50% if they get exactly 70% on all Type B material,
and 0% on all Type C material
i.e. **50% truly means a minimum competency pass**.
To get a higher grade, students need to do better than 70% on Type B's
and/or get some Type C marks.

CLO 1 25%
20% RLO 1.2 weighted 75% on Type B, 25% on Type C
15% RLO 1.3 weighted 70% on Type B, 30% on Type C
35% RLO 1.4 weighted 70% on Type B, 30% on Type C
30% RLO 1.5 weighted 70% on Type B, 30% on Type C
Type B 70% x (75%x20% + 70%x15% + 70%x30% + 70%x35%) = 49.7%

… or equivalently

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CLO 1 25%	RLO 1.2	15.0% Type B	5.0% Type C
	RLO 1.3	10.5% Type B	4.5% Type C
	RLO 1.4	24.5% Type B	10.5% Type C
	RLO 1.5	21.0% Type B	9.0% Type C
	Type B 70% x 71% = 49.7%		

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- **Consideration 3: determine performance levels required to complete/pass CLOs/RLOs**
  - **recall our question "Type" specifications**
  - **going hardline, we'd stick to these standards for every RLO … but we don't yet**
  - **instead we go with *average* Type B (or B+) grade *per CLO***

Type A — **fundamental knowledge and skills that need to be automatized**
- pass/fail, unlimited tries, automated evaluation

Type B — **basic fully integrated problems, characteristic of the field**
- need at least 70% to pass module, multiple tries (3+), marked by TAs

Type B+ — **typically writing/design assignments (results span the B/C range)**
- need at least 50% to pass module, multiple tries (2+), marked by TAs/instructors

Type C — **"difficult" fully integrated problems; tough/tricky problems**
- no minimum grade required, single chances, marked by instructors

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

So instead of having to achieve at least 70% on Type B's in **every** RLO, they have to get at least 70% on Type B's **across all** RLOs within each CLO.
Note that students can get "natural" grades over 50% that are fails, because they don't get at least 70% in their Type B's but they do get some marks for Type C's. In this case, we give them 49%.

CLO 1 25%	RLO 1.2	15.0% Type B	5.0% Type C
	RLO 1.3	10.5% Type B	4.5% Type C
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	Type B 70% x 71% = 49.7%		

… one more important detail for setting performance expectations: **rubrics**

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

			Learning Outcomes	Learning Outcome
			RLO 1.2-1.5	RLO 5.1 (Tech Comm)
Category	**Grade Value**		**See Statics LOs (e.g. apply 2D equations of equilibrium to calculate unknown forces in 2D particle equilibrium problems)**	**express hypotheses, experimental results, and conclusions**
Mastery	100		accurate/complete diagram(s), correct/matching equation(s), correct computations, clear solution presentation, no gaps in process logic i.e. no errors and nothing is missing	no S&G or format errors, very clear, concise and complete
Developing Mastery	90		mastery except 1 small error i.e. a minor computation mistake, a small error in clarity, a minor gap in process, or a minor error/omission in a diagram	mastery except 1-2 non-repetitive S&G errors, or a format error, but clear and complete
Competence	70		right/complete approach with 2-3 small errors (computational, process logic, clarity, missing/wrong diagram feature or equation term)	up to 1 repeating and/or 3-4 non-repetitive S&G or format errors, clear and complete
Developing Competence	50		right approach but 1 major error i.e. major mismatches/errors/omissions in equations/diagrams, major computational error, process logic wrong/missing/unclear, or equation terms missing, and/or missing as much as 50% of the solution	2-3 repeating S&G or format errors, some lack of clarity and/or incompleteness
Not Yet Competent	30		an incomplete (i.e. <50%) attempt to solve and/or wrong approach (or we can't understand it) including 2+ large errors (computational, missing steps, missing/ wrong diagram features or equations)	repetitive S&G or format errors, generally unclear and incomplete
No Evidence of Competence	0		no meaningful submission	no meaningful submission for one or more of the hypotheses, results, and conclusions

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- **Consideration 4: when and how many evaluation opportunities are offered, taking into account assessment feedback and instructional/tutorial support?**
  - **we'll focus on Assignments and the Module Test for now (not Labs, Type A's, TU)**
    - All Module 1 assignments are released Tuesday mornings, and are due following Tuesday nights
    - Assignment 1
      - a) 2D parallelogram (B), b) 2D triangle (B), c) 2D dot product (B), d) 2D Cartesian vector sum (B)
      - assess diagrams and calculations for triangle and Cartesian (1.2x2B); dot product (1.3x1B); IDing problem types/features (4.2x1B)
    - Assignment 2
      - a) 3D Cartesian force vector sum (B), b) 2D triangle (C), c) 3D dot product (B), d) 2D equilibrium (B)
      - assess diagrams and calculations for triangle and Cartesian (1.2x1C/1B), dot product (1.3x1B), 2D equilibrium (1.4x1B); framing accuracy/thoroughness (4.1x1B), IDing problem types/features (4.2x1B), and expressing proper notation (5.2x1B)
    - Assignment 3
      - a) 2D dot product (C), b) 2D equilibrium (B), c) 3D equilibrium (B), d) 3D equilibrium (C)
      - assess diagrams and calculations for dot product (1.3x1C), 2D equilibrium (1.4x1B), 3D equilibrium (1.5x1B/1C); IDing problem types/features (4.2x1C), formatting steps/flow (5.3x1B), expressing proper notation (5.2x1B), and drawing 3D axes/isometrics (5.4x1B)
    - Module Test
      - a) 2D triangle (B), b) 3D dot product (B), c) 2D particle equilibrium (C), d) 3D particle equilibrium (B)
      - assess diagrams and calculations for triangle (1.2x1B), dot product (1.3x1B), 2D particle equilibrium (1.4x1C), 3D particle equilibrium (1.5x1B); framing accuracy/thoroughness (4.1x1B), IDing problem types/features (4.2x1C), formatting steps/flow (5.3x1B), and drawing 3D axes/isometrics (5.4x1B)

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- Consideration 4: when and how many evaluation opportunities are offered, taking into account assessment feedback and instructional/tutorial support?
  - note below: CLO4 is Generalized Problem Solving and CLO5 is Tech Comm

RLO	Assign 1	Assign 2	Assign 3	Mod Test	Top Up
1.2	BB	BC		B	B
1.3	B	B	C	B	B
1.4		B	B	C	B
1.5			BC	B	B
4.1		B		B	
4.2	B	B	C	C	
5.2		B	B		
5.3			B	B	
5.4			B	B	

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

- **Consideration 5: what is the requirement to complete the course? which and/or how many CLOs/RLOs are required for completion?**
  - **must pass every CLO**
  - **passing every CLO = completing Type A's and achieving a passing average for Type B's (and/or B+'s) in every CLO**
  - **it does not (yet) mean passing every RLO in every CLO**

Example 1: Statics Course

An Engineering Science, Problem Solving, Lab Based, Computational Course

➔ Consideration 6: how will students know about their performance relative to CLOs?

1) they get model answers immediately after submission due dates
2) they get graded assessments back within a week … usually
3) they are given a grade calculator (Excel sheet) for the course i.e. they can plug in their grades, and it shows final results (but remember, the meaning of past grades depends on future grades)
4) as assessments are graded (on Crowdmark), results can be seen on Crowdmark and they get posted to the Grades area of Canvas
5) grading on Crowdmark shows competency level, percentage, rubric message, and individualized feedback … usually

Knowledge Check (WLO1)

Select the best response to the following question:

When designing a CBA module, which of the following is **not** a key element:

(a) There must be multiple opportunities to demonstrate a competency spaced between feedback
(b) It must be possible to distinguish performance on each competency assessed by an assessment event.
(c) Students must be offered the same test repeatedly in order to demonstrate competence.
(d) Students must be able to easily see their progress toward demonstrating learning outcomes.

Example 2:
Project-based first year design course

*Hybrid** CBA in first year engineering design and practice

Hybrid* = course grades calculated as traditional weighted mean, but students **also required to demonstrate performance in certain outcomes

Example 2 (First year design) Implementation

Consideration	Implementation
1. What are the CLOs/sub-CLOs?	Math modeling, communication, teamwork, reflection
2. What is the relative importance/weighting of CLOs/sub-CLOs?	CLOs all required to pass.
3. Determining performance required to complete CLOs/sub-CLOs	Modeling: Quizzes, Reports (formative), Tests (summative) Communication: Quizzes, Reports (formative), Tests (summative) Reflection: Quizzes, Reports (formative), Tests (summative) Teamwork: Peer and project manager evaluations
4. When are iterative evaluation opportunities offered, with feedback/support?	*Formative weekly individual quizzes, sequential reports, interim feedback, satisfactory performance required once. Oral interviews after multiple attempts.*
5. What is the requirement to complete the course? Which/how many CLOs are required for completion?	Satisfactory performance on CLOs AND 50% course grade. Course grade calculated by standard weighted average of assessments.
6. How will students know about their performance relative to the CLOs?	LMS Gradebook shows complete/not complete for each competency, or auto-generated email updates.

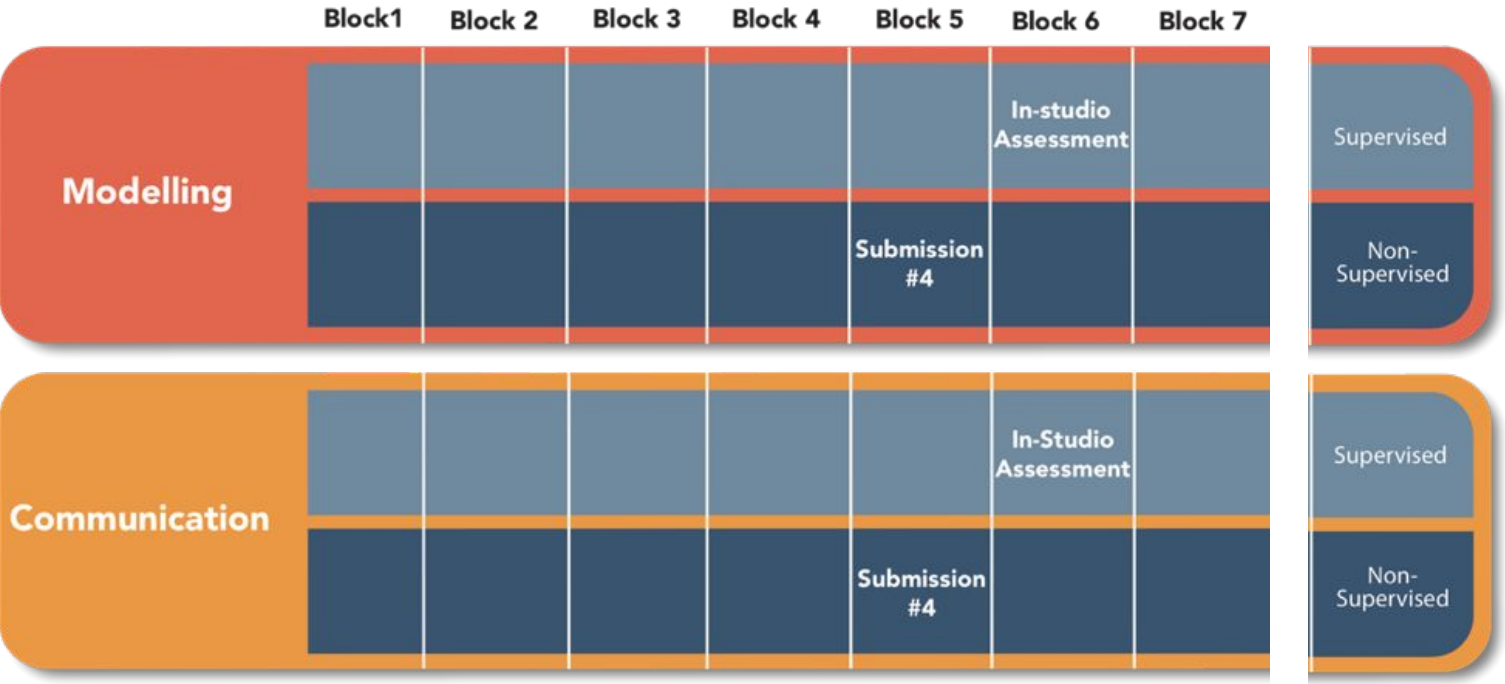
CLOs

Modelling	Create and use quantitative models to analyze systems (for technically simple complex problems).
Communication	Effectively communicate in written form following disciplinary conventions and using standard grammar and mechanics.
Teaming	Work effectively and respectfully in a team (with significant external guidance)
Reflection	Critically reflect on self and team performance (in context of technically simple complex problems).

Example 2: Design course

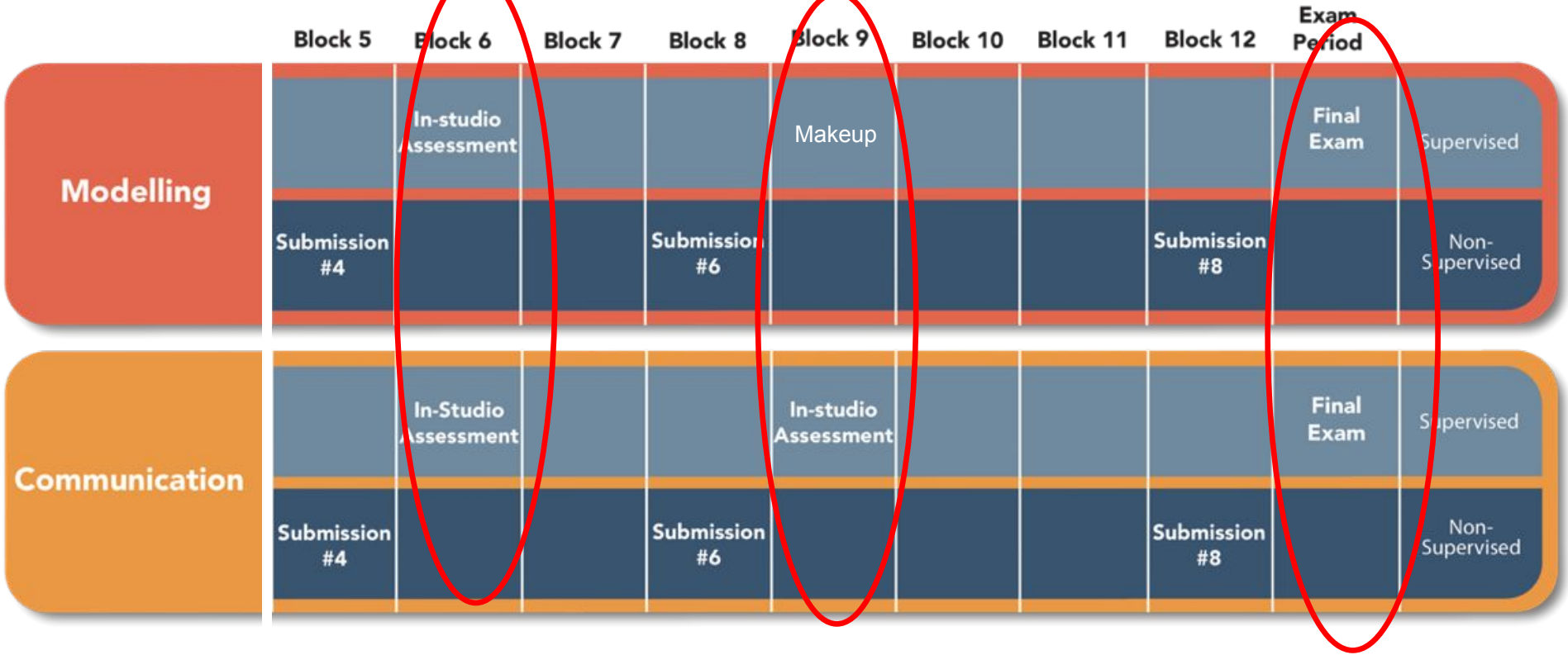
Consideration 4: Iterative evaluation and feedback

Instruction, LMS quizzes, team assessments for formative feedback.



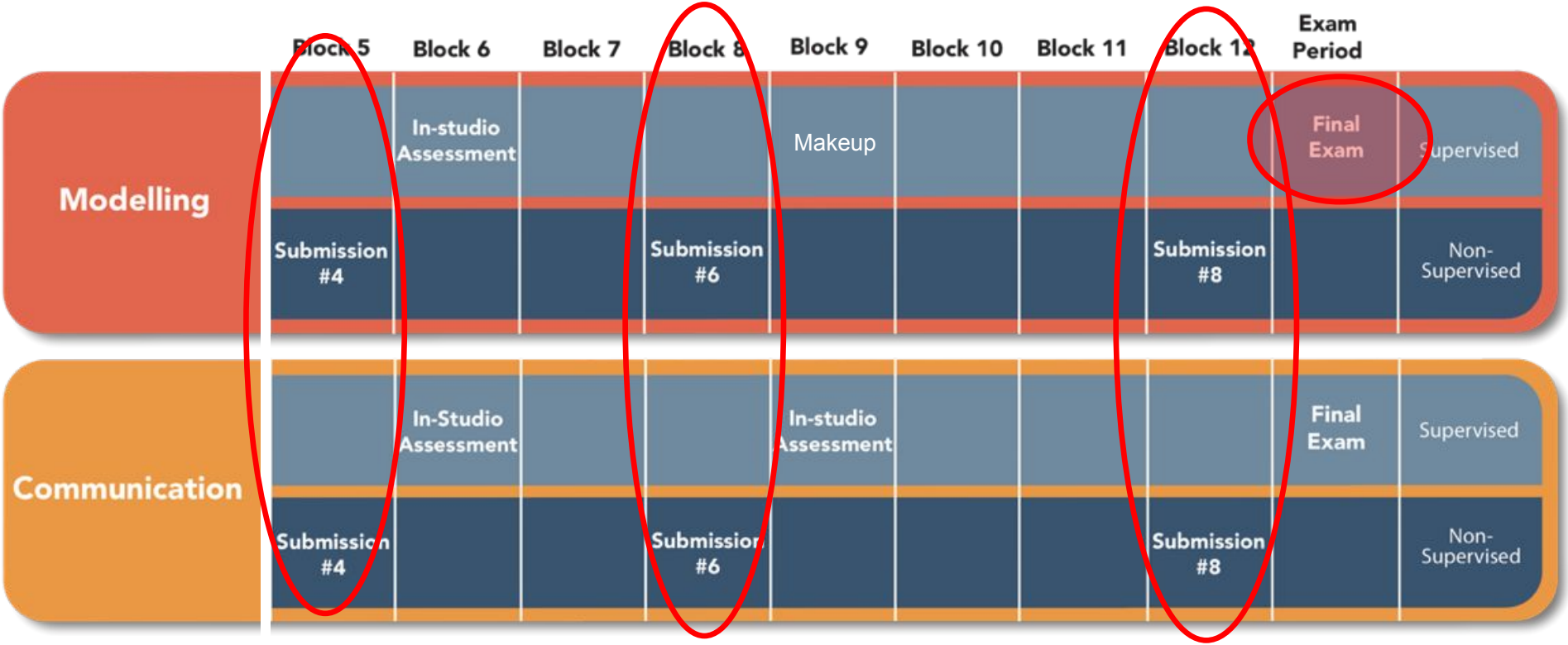
Example 2: Design course

Consideration 4: Iterative evaluation and feedback



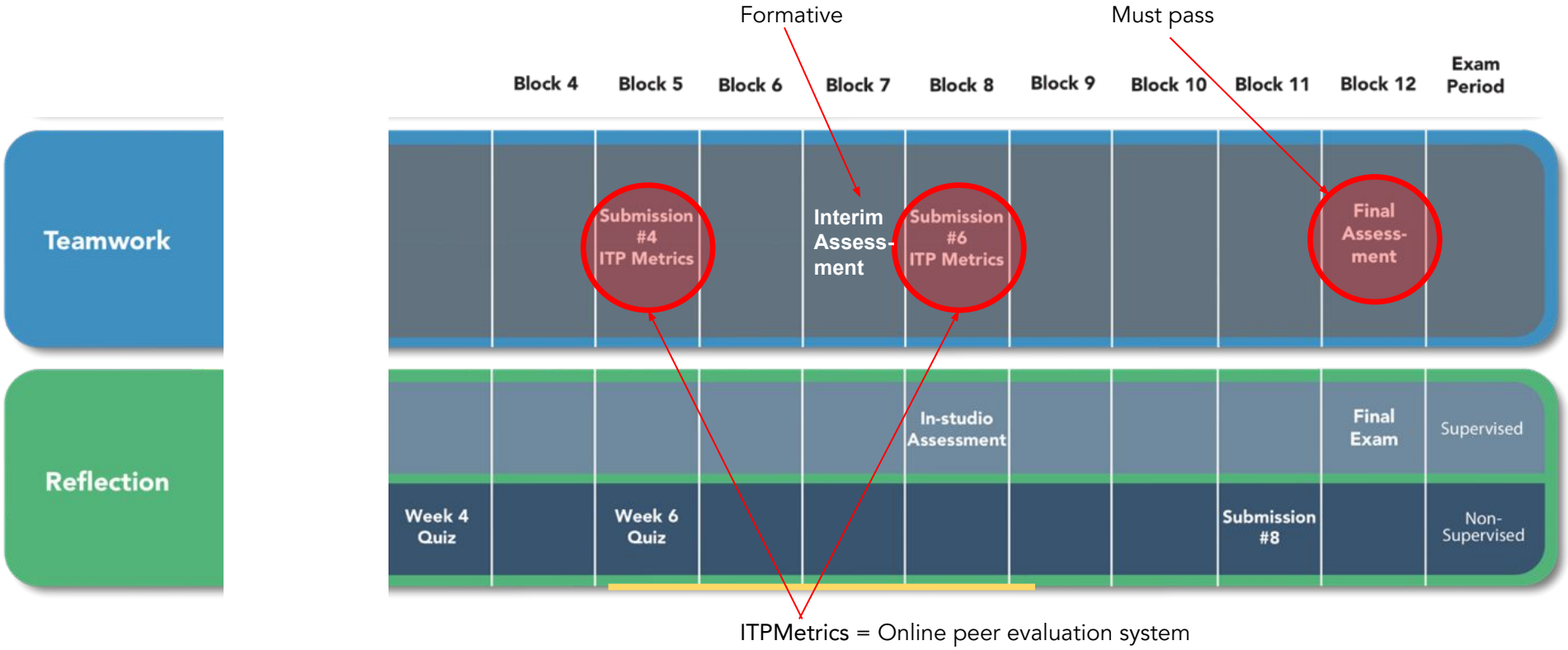
Example 2: Design course

Consideration 4: Iterative evaluation and feedback



Example 2: Design course

Consideration 4: Iterative evaluation and feedback



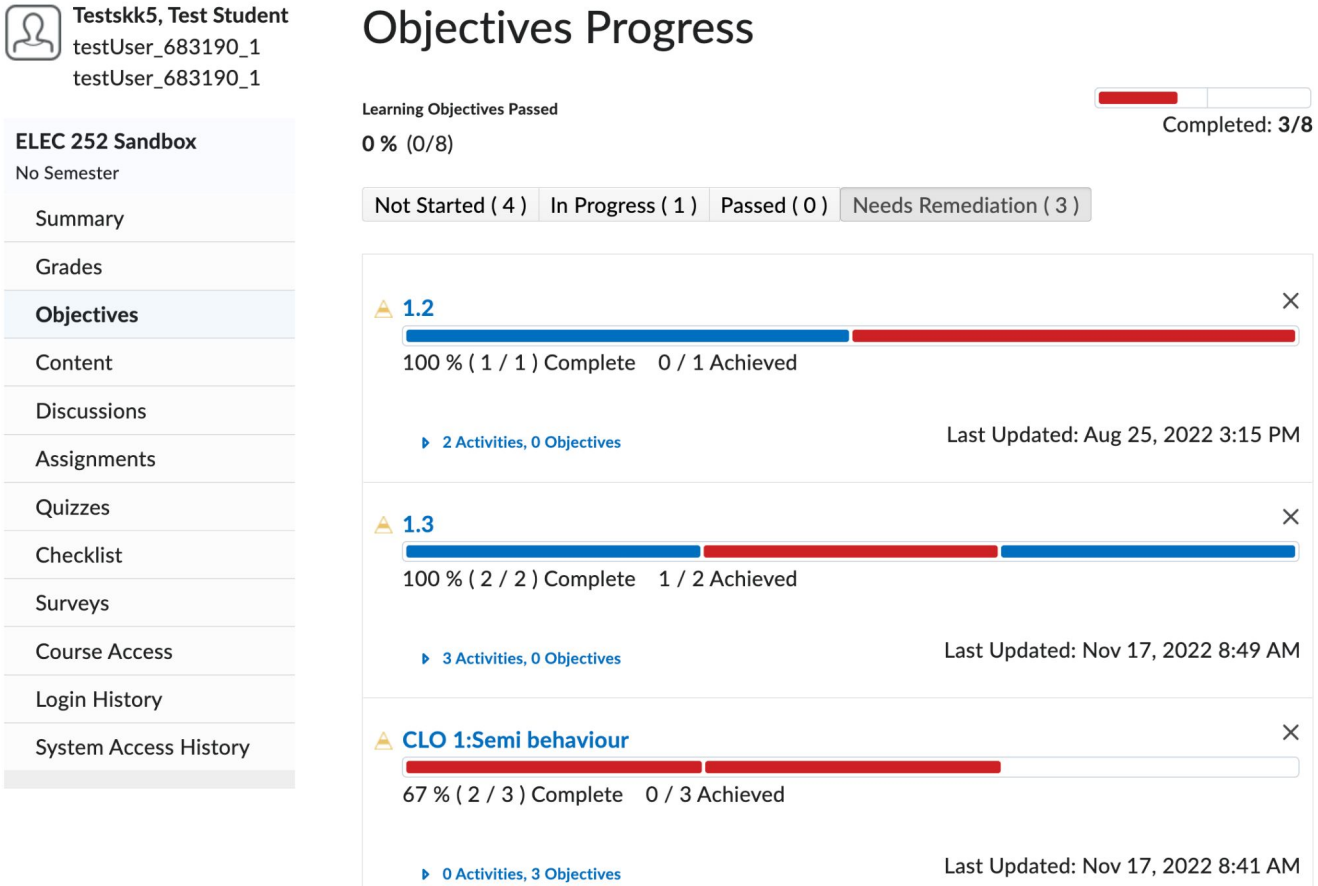
Example 2: Design course

Consideration 5: Completion requirements

	7-8 Outstanding	6 Expectation	5 Minimum competency		
Model	**Meet expectations on each outcome at least once →**		Model has minor errors or a relatively small number of unsupported approximations or assumptions		
Self-reflection			Describes, analyzes, and evaluates individual and team performance, with some superficial analysis not directly related to the team's actions.		
Teaming			Participated and attended most meetings and most assigned status updates, completed their fair share of the work.		

Example 2: Design course

Consideration 6: Communicating progress



Pilots using Competency-based assessment (2019, 2022)

2019: ~50 improved to meet expectations who probably wouldn't under traditional grading.

- Only one student failed due competency alone, and they were able to demonstrate it in the follow-on design module, then pass
- Other students who failed the competencies also failed the course
- The competency structure identified struggling students and allowed assistance

In 2022: 132 fell below at least one requirement in week 5; with support and repeated opportunity, down to 35, then 2 who were missing other requirements.

Typical course fail rate:	~ 1%
Course fail rate with CBA:	~ 1%

Task 1: Evaluate a CBA course proposal

In this scenario (see Task 1) you have been asked to provide feedback on a colleague's initial attempt to convert their first year professional practice and design course into a "hybrid" competency-based assessment course. You'll use the structure below (also shown under Task 1 in the handout) to identify the questions and suggestions you would make to your colleague about their proposal so far.

Considerations	**Feedback your group is asked to provide:**
1. What are the CLOs/sub-CLOs?	*None - you can assume these are appropriate to the course*
2. What is the relative importance/ weighting of CLOs/sub-CLOs?	*None - you can assume these are appropriate to the course*
3. Determine performance levels required to complete/pass CLOs/sub-CLOs	*Are minimum performance levels reasonable and appropriate to the CLO? (**Table 1**)*
4. When and how many evaluation opportunities are offered, with appropriate instructional and feedback?	*Are there opportunities to develop outcome, with formative feedback, and multiple opportunities provided to demonstrate competency? (**Table 2**)*
5. What is the requirement to complete the course?	*Are requirements understandable and assure that students demonstrate all requirements (**Page 2**)*
6. How will students know about their performance relative to the CLOs?	*Is there a regularly updated communication to students about their standing relative to expectations? **(Page 2)***

https://drive.google.com/file/d/1YVsg--2O4eED2X13QM_23qNbl1zS9VpS/view?usp=share_link

Task 1 follow-up

Considerations	Possible issues with the proposal
3. Determine performance levels required to demonstrate CLOs	Is this actually competence in written comm: *“Verbose, disorganized and difficult to understand writing and graphics poorly directed at the audience with many grammatical errors.”*
4. When and how many evaluation opportunities are offered, with appropriate instructional and feedback?	No formative feedback provided for communications before the first competency assessment in week 6. Is an earlier competency assessment possible? No explicit instruction in communications? Final exam may not be appropriate to evaluate teaming.
5. What is the requirement to complete the course?	Only two opportunities to demonstrate competence makes for high risk and stress for students, high stakes exam. Can other evaluations be used to demonstrate competence?
6. How will students know about their performance relative to the CLOs?	Students should have ongoing status updates so they know where to focus

Task 2: Develop a ideas for another CBA course proposal

In this scenario (see Task 2) you have been asked implement CBA in a design course with grades calculated on the basis of competency performance. You'll use the structure below to make suggestions about the course design.

Considerations	**Your team's role**
1. What are the learning outcomes (CLOs/RLOs)?	*N/A - you can assume that these are given (see next page)*
2. What are the difficulty levels and relative importances/weightings of the CLOs/RLOs?	*How would you weight the CLOs, and the RLOs within them? What type of tasks/questions would work for these RLOs i.e. Type A/B/B+/C?*
3. Determine performance levels required to complete/pass CLOs/RLOs	*Set minimum performance levels reasonable and appropriate to the CLOs*
4. When and how many evaluation opportunities are offered, with appropriate instructional and feedback?	*Can you provide opportunities to develop outcomes, with formative feedback, and multiple opportunities provided to demonstrate competency?*
5. What are the requirements to complete the course relative to the CLOs?	*Set reasonable requirements for these CLOs*
6. How will students know about their performance relative to the CLOs?	*What kind(s) of regularly updated communication can be provided to students about their standing relative to expectations?*

Select the document corresponding to your table (Table 1, Table 2, etc.) in the folder at the link below, and do your work in that document:

https://drive.google.com/drive/folders/1oiX6XIx5k79n-d7PWIUc757MMYAgRQk4?usp=share_link

Task 2 followup

Tips, Suggestions and Cautions

1. Tracking competencies: can be tracked directly in some LMS's, or by using gradebook items, helping students monitor progress. Or competencies can be tracked in spreadsheets, though showing progress with students is a challenge.
2. Consider having a *top-up* assessment opportunity after the end of the traditional term (or module).
3. Consider running CBA in parallel with a traditional grading scheme to avoid making significant changes in failure rate that are not in the students' favour.
4. Plan to monitor performance and adapt requirements.
5. Timely, high quality feedback is critical.
6. Additional resources for coordination, regrading and remediation can be valuable.

Review of Our WLOs

By the end of this workshop, you will be able to:

1. Describe key elements of CBA
2. Evaluate how well assessment systems align with principles of CBA
3. Evaluate a course assessment plan for alignment with CBA

Implementing CBA literature

Overviews:

Henri et al., 2017, JEE: Review of competency-based learning.

Canadian implementation examples

Lessons learned from using competency based assessment in a first year Eng Statics course, Maw & Frey, CEEA 2021.
Implementing Competency-based assessment in a first year design course, Frank et al., CEEA 2021
A competency-based, student-centered assessment Model for Engineering Design, (CEEA 2004 , Johnstone et al., University of Calgary)

Other Implementation examples

Implementing competency based assessment in an undergraduate thermodynamics course (ASEE, 2020, Nicole Okamoto, San Jose State university)
Reinventing evaluations with competency based assessments: a practical experiment with future computer science engineers (Frontiers in Education Conference, 2020)
A novel approach to mastery based assessment in sophomore-level mechanics course (Hjelmstad et al., ASEE, 2020)
Competency-based Assessment in Dynamics, (DeGoede, Elizabethtown College, ASEE, 2018)
Adapted mastery grading for statistics (ASEE,2017)
Converting a traditional engineering technology program to a competency based, self paced, open entry/open exit format (ASEE, 2015)

Final Words

- Welcome questions (contact us at sean.maw@usask.ca and brian.frank@queensu.ca)
- Slides will be available afterwards

Agenda

12:35 - 12:45 pm	*Questions, Table Conversations and Break Option*
12:45 - 12:50 pm	**CEEA-ACEG 2023 Conference - an introduction** Dean Richert, Assistant Professor, UBC, Okanagan Campus
12:50 - 1:00 pm	**Reflective Panel**
1:00 - 1:30 pm	*SCREEN BREAK (note Room Change for Afternoon Workshop)*
1:30 - 2:20 pm	**Competency Based Assessment in First year engineering at University of Saskatchewan** Sean Maw, Associate Professor, University of Saskatchewan
2:20 - 2:30 pm	*Questions, Table Conversations and Break Option*
2:30 - 4:00 pm	**Implementing Competency Based Assessment in Engineering (Workshop including breakouts with facilitators)** Sean Maw, Associate Professor, University of Saskatchewan Brian Frank, Professor, Queen's University
4:00 - 4:10 pm	**Reflective Panel: Carol Jaeger and Pemberton Cyrus**
4:10 - 4:20 pm	**May 2023 CBA Course Construction Workshop** Brian Frank, Professor, Queen's University **CEEA-ACEG Special Announcement** Peter Ostafichuk, Professor, UBC, President of CEEA-ACEG, 2022/23
4:20 - 4:30 pm	**Thanks and Formal Closing**
4:30 - 5:30 pm	*Post Event Table Conversations*

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4:30 - 5:30 pm	*Post Event Table Conversations*

If you enjoyed today's exploration of Competency Based Assessment, we encourage you sign up for notifications for an

IN PERSON

CBA Course Conversion Event at Queen's University coming in May 2023

The plans for this full day event include:

- A series of interactive sessions where you have the opportunity to work with peers in a guided setting to convert a course of your choosing to a CBA framework
- A series of speakers from a variety of professional contexts providing insights into their CBA experience
- An evening event to allow attendees to engage in a deeper discussion of the topic

More details to come; a post event email will offer the chance to sign up for notifications.

Agenda

12:35 - 12:45 pm	*Questions, Table Conversations and Break Option*
12:45 - 12:50 pm	**CEEA-ACEG 2023 Conference - an introduction** Dean Richert, Assistant Professor , UBC, Okanagan Campus
12:50 - 1:00 pm	**Reflective Panel**
1:00 - 1:30 pm	*SCREEN BREAK (note Room Change for Afternoon Workshop)*
1:30 - 2:20 pm	**Competency Based Assessment in First year engineering at University of Saskatchewan** Sean Maw, Associate Professor, University of Saskatchewan
2:20 - 2:30 pm	*Questions, Table Conversations and Break Option*
2:30 - 4:00 pm	**Implementing Competency Based Assessment in Engineering (Workshop including breakouts with facilitators)** Sean Maw, Associate Professor, University of Saskatchewan Brian Frank, Professor, Queen's University
4:00 - 4:10 pm	**Reflective Panel**
4:10 - 4:20 pm	**May 2023 CBA Course Construction Workshop** Brian Frank, Professor, Queen's University **CEEA-ACEG Special Announcement** Peter Ostafichuk, Professor, UBC, President of CEEA-ACEG, 2022/23
4:20 - 4:30 pm	**Thanks and Formal Closing**
4:30 - 5:30 pm	*Post Event Table Conversations*

Post-event followup, survey, and notice about May 2023 event