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# WHERE TO START WITH COURSE DESIGN

## FOUNDATIONS OF COURSE DESIGN

AUTHORED BY:
Lorelei Anselmo, MEd., Lin Yu, MEd., Patrick Kelly, MSc.

**Where to start with course design**

Course design is a continuous process and can guide decision making throughout a course lifecycle. All courses have similar course design elements yet where you start depends on the context and how the course fits into the program. Generally, course designs fit into the follow categories:

- a new course design:
    - often starts from scratch, and the main course elements (learning outcomes, assessment and instruction/activities) need to be developed.
- a redesign of an existing course:
    - could be the entire course or specific elements such as updating content or changing student assessments.
- an inherited course :
    - where the instructor must follow the course learning outcomes and assessments while having control over how the course is taught.

**Key Concepts of course design**

- Constructive alignment: The intentional alignment between course learning outcomes, assessments, activities and content and other course elements that support student-centred, outcome-based learning (Biggs, 1996; Loughlin et al., 2020).
- Course context: contextual factors include where the course fits in with the overall program, pre-requisites, number of students, year of study.
- Pedagogical approach: The theoretical teaching and learning approach that best fits the intended learning experience. Common approaches include authentic learning, inquiry-based, course-based undergraduate research (CURE), problem based, project based, self-study and more (link to a list).
- The student learning experience: Each student will experience the course in their own way based on their pre-existing knowledge, values, motivation and relevance.
- Inclusive course design: Integrates inclusivity strategies to help foster a learning environment and culture that values diverse perspectives, identities, and experiences of the students and a whole.

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**Course design in action**

One place to start with any course design/redesign is to think about the overall desired learning experience is for students. Fink (2003) describes significant learning where students have meaningful and memorable learning experiences. By considering what the purpose and intent of the course is you can make design choices to foster such an experience.

- Reflect on your own teaching philosophy (https://taylorinstitute.ucalgary.ca/resources/writing-a-teaching-philosophy-statement) and consider how your values, approaches and desired impact has on the course design and the student learning experience. Your philosophy can inform pedagogical approaches, assessment methods, interactions, relationships, and student engagement.
- Ask yourself 'In 10 years' time what do I hope students will remember about this course?'
- What are the big ideas or question(s) the course will pursue.?These big ideas or questions can stimulate curiosity and interest.
- Consider why students are taking this course, what their own learning goals are and the relevance to their lives.
- Identify the core needs required in a typical profession and how these skills, knowledge and abilities can be integrated into the course. Common skills include collaboration, leadership, and problem solving or meeting professional expectations.

**Try this:**

What is the meta or big question for the course? The big question is generally open-ended, thought provoking and closely related to the discipline. Use this question as the overarching umbrella to guide the design of the course.

For example, in a biology course the big question could be "What is life?", or in an environmental science course "How can we create change in modern water conservation?

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**Additional Reading:**

Inclusive course design: https://er.educause.edu/articles/2022/3/inclusive-addie-initial-considerations-for-dei-pedagogy

Hommel, D. (2022, May 25). Aspiring to create learning experiences students remember. Faculty Focus. https://www.facultyfocus.com/articles/effective-classroom-management/aspiring-to-create-learning-experiences-students-remember/

**References**

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher education*, *32*(3), 347-364. https://link.springer.com/article/10.1007/BF00138871

Fink, L. D. (2003). A self-directed guide to designing courses for significant learning. *University of Oklahoma*, *27*(11), 1-33. https://www.acousticslab.org/dots_sample/general/Fink2003SelfDirected.pdf

Loughlin, C., Lygo-Baker, S., & Lindberg-Sand, Å. (2020). Reclaiming constructive alignment. *European Journal of Higher Education*, *11*(2), 119–136. https://doi.org/10.1080/21568235.2020.1816197

Page, R. (2016, March 9). The metaquestion: a different approach to course design. https://cte.rice.edu/blog/2016/metaquestions

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# CONSTRUCTIVE ALIGNMENT

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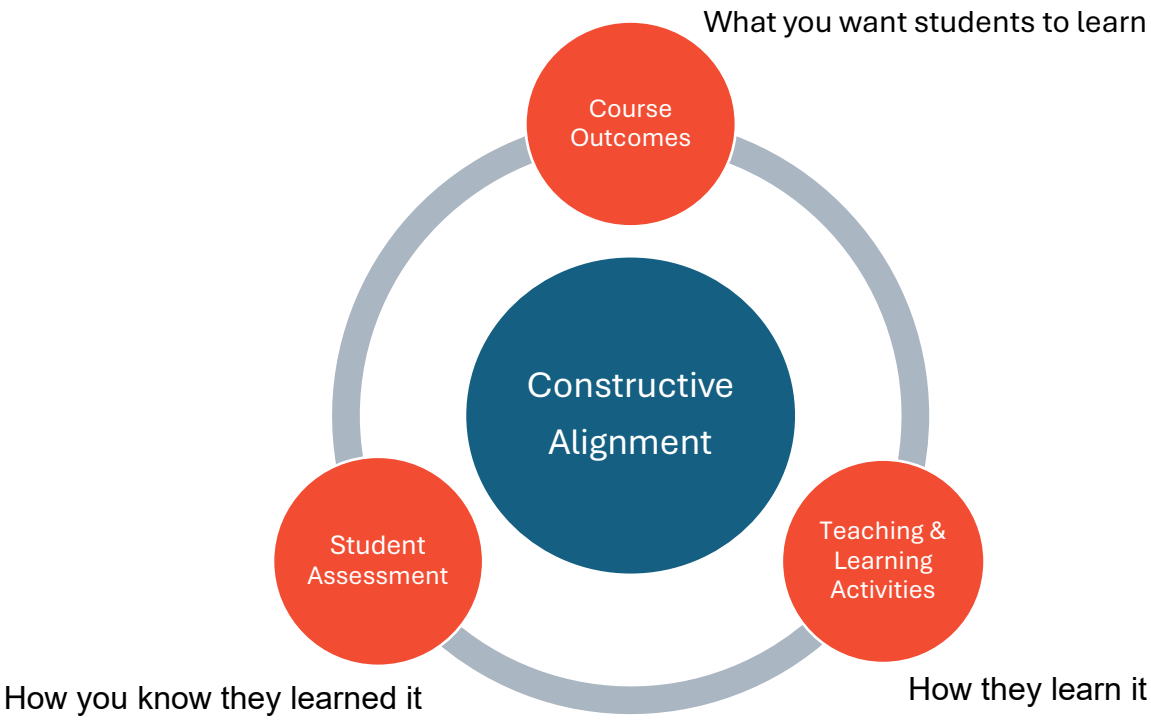
## Constructive Alignment

Constructive alignment is the intentional connection of course elements to ensure that instruction and assessment match the learning outcomes (Biggs, 1996; Loughlin et al, 2020). Alignment spans an entire course design, including learning outcomes, assessments, content selection and activities throughout the course (Blaženka et a., 2023).




### Key Concepts

*Course Learning Outcomes*: Statements that describe the intended learning of the students.

*Student Assessments*: Methods to measure the students' ability to perform the course learning outcomes

*Teaching and learning activities*: The instruction and activities the instructor and students engage in throughout the course. These activities include lecturing, reading, discussions, feedback, and more.

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*Bloom's Taxonomy:* A hierarchical learning theory to structure the level and type of learning to define the course learning outcomes, assessments and learning activities.

**Constructive Alignment in Action**

1. To help connect course components create an alignment chart to plan the alignment between the course learning outcomes, activities and assessments.
2. Make note of due dates to establish a realistic flow to the course timelines, finding a balance between time expectations to achieve outcomes and the amount of course content. (link to selecting content section)

**Figure 1: Before and after example to enhance alignment**

| **Course learning outcome:** | **Teaching and learning activities:** | **Ways of assessing this learning:** |
|---|---|---|
| By the end of the course, students will be expected to write an essay, analyzing complex issues using multiple sources of evidence to support their argument. | Lecture, readings, tutorials, critiques | Quiz (short answer questions),<br>Critique assignment |

| **Course learning outcome:** | **Teaching and learning activities:** | **Ways of assessing this learning** |
|---|---|---|
| By the end of the course, students will be expected to **analyze** complex issues using multiple sources of evidence to support their argument. | Lecture, readings, tutorials, critiques, **peer feedback** | Critique assignment,<br>**Essay with reflective component** |

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**Try this**

Reflect on the desired student learning experience and consider what course elements can be connected through constructive alignment. Course elements may include course content, fostering relationships, a student-centred course outline, activities that encourage connection, and feedback that supports growth. By aligning these factors to assessments and course learning outcomes, you can design a positive student learning experience.

**Further Reading**

Anselmo, L., Bari, H. Kelly, P. & Yu, Lin. *Innovative Approaches to Course Design*. Taylor Institute for Teaching and Learning, University of Calgary. https://taylorinstitute.ucalgary.ca/resources/innovative-approaches-to-course-design

**Artificial intelligence resources:**

Pereira, E., Nsair, S., Pereira, L. R., & Grant, K. (2024). Constructive alignment in a graduate-level project management course: an innovative framework using large language models. *International Journal of Educational Technology in Higher Education, 21*(25), 1-21, https://doi?org/10.1186/s41239-024-00457-2

**References**

Biggs, J. (1996). Enhancing teaching through constructive alignment. *Higher education*, *32*(3), 347-364. https://link.springer.com/article/10.1007/BF00138871

Krathwohl, D. R. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory Into Practice*, *41*(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

Divjak, B., & Svetec, B., & Horvat, D,. & Kadoić, N. (2023). Assessment validity and learning analytics as prerequisites for ensuring student-centred learning design. *British Journal of Educational Technology, 54*(1). 10.1111/bjet.13290.

Loughlin, C., Lygo-Baker, S., & Lindberg-Sand, Å. (2020). Reclaiming constructive alignment. *European Journal of Higher Education*, *11*(2), 119–136. https://doi.org/10.1080/21568235.2020.1816197

Hailikari, T., Virtanen, V., Vesalainen, M., & Postareff, L. (2022). Student perspectives on how different elements of constructive alignment support active learning. Active Learning in Higher Education, 23(3), 217-231. https://doi.org/10.1177/1469787421989160

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# LING 309 LANGUAGE AND POWER SUMMER 2023 (AN EXAMPLE)

## FOUNDATIONS OF COURSE DESIGN

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## LING 309 *Language and Power* Summer 2023 (Example for Constructive Alignment)

This example alignment chart demonstrates how course learning outcomes can be aligned to teaching and learning activities and student assessment methods:

1. A variety of teaching and learning activities and assessment methods can be used to measure course learning outcomes throughout the course.
2. A specific teaching and learning activity can be used to scaffold student learning in preparation for the assessment.
3. A specific assessment method can be used to measure multiple levels of learning by varying the questions/purpose of that assessment.

**Course context**:

This 3-credit course will focus on the use of language to create, enhance and justify positions of dominance or subordination, or to influence and persuade populations. It will look at how language reflects a speaker's age, ethnicity, gender and class and examine how language represents and constructs a speaker's identity and attitude to language use.

The course aims to develop students' awareness of linguistic diversity as well as linguistic tolerance and empathy. The long-term goal of the course is to contribute to greater linguistic justice.

**Number of Students**:

100 students, often attended by Communications and Film, Political Science, Linguistics and Languages students

**Course Learning Outcomes**:

By the end of the course, students are expected to:

- Apply sociolinguistic concepts to everyday situations and their own life.
- Analyze the ways in which language can reinforce or challenge social hierarchies and discriminations within a community, drawing connections between language policy and linguistic justice.
- Interpret the representation of identity in language use, considering factors such as age, ethnicity, gender, and class.
- Evaluate the impact of linguistic diversity on societal interactions, recognizing the contributions of various cultural and social groups, including their own.

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| **Course Learning Outcome(s)**<br>*What should students be able to do, know, or value by the end of the course?* | **Teaching & Learning Activities** | **Student Assessment Method**<br>*(Grade %)* | **Level of Bloom's Taxonomy** | | |
|---|---|---|---|---|---|
| | | | *Remember/ Comprehend* | *Apply/Analyze* | *Evaluate/Create* |
| 1. Compare and contrast key sociolinguistic concepts based on factors influencing language choice such as age, ethnicity, gender, and class. | **Instructor does**:<br>Lectures<br>Creates thought-provoking discussion questions allowing students to reflect on sociolinguistic concepts covered in class. Encourages students to engage in self-reflections of class material, providing examples from their own lives.<br><br>**Students do**:<br>Reading, listening to lectures<br>Participate in small group and large group discussions on a given topic. | **4 online quizzes on D2L (4 x 5%) - 20%**<br><br>15-20 questions each of different types (multiple choice, true/false, drop and drag, fill in the blanks). Question pools and a randomization feature in used.<br>Open book (students are allowed to use their notes, the instructor's slides, the textbook) | ✓ | ✓ | |
| 2. Develop awareness of linguistic diversity as well as linguistic tolerance and empathy.<br>3. Apply sociolinguistic concepts to everyday situations and their own life. | **Instructor does**:<br>Lectures<br>Presents factors influencing language choice and sets up student group discussions in person and online (using Top Hat). At the end of each discussion, there is a debrief and a general summary, reinforcing the notions studied in class. | **2 online discussions of assigned readings** (at least 1 post and 1 response to another student's post per discussion) - 15%<br>Choose two topics from the forum to which they contribute at least one post and respond to at least one other student's post. | ✓ | ✓ | ✓ |

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| | **Students do**:<br>Reading, listening to lectures<br>Analyze the sociolinguistic concepts, establishing connections between the assigned readings and the lecture. | Establish connections between the assigned readings, lectures and everyday life, providing examples from their own life. | | | |
| 4. Develop a language policy for a particular country, taking into account ways in which language can reinforce or challenge social hierarchies and discriminations. | **The instructor** describes the main notions related to language policy and asks students to provide examples of countries corresponding to the presented models.<br>**Students** discuss the examples of language policies in countries around the world.<br>**Students** do an ungraded trivia game on the covered concepts and examples. | **Group Project - 25%**<br>(group presentation – 10% + final project submission – 15%).<br>**The instructor** 1) creates D2L groups of 4-5 participants with the names of countries the language situation and policy of which students will research; 2) posts a clear plan with the steps students need to take before they submit their final project; 3) provides a list of resources students can draw on when working on the group project.<br><br>**Students** 1) self-enrol into one of the groups based on the country they are interested in researching; 2) allocate roles with the | ✓ | ✓ | ✓ |

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| | | group; 3) create a draft of the project which they will present to the TA; 4) receive feedback from the TA and share an abstract of their project in D2L Discussions and give feedback to other groups on their respective projects; 4) create the final version of the project which they will submit to D2L Dropbox. | | | |
| 5. Synthesize and critically reflect on concepts related to linguistic diversity and how they affect the everyday life of various cultural and social groups, including their own. | **The instructor** encourages students to share examples from their own life in class discussions to demonstrate the studied concepts. Divides students into groups asking them to create a poster on a given topic, demonstrating connections between different sociolinguistic concepts.<br><br>**Students do:** Review the class material and create posters demonstrating connections between sociolinguistic concepts, do a gallery walk | **Final reflective essay (30%)** 10-12 questions that students respond to in 200-300 words each, connecting the lectures, assigned readings and their personal experiences. | ✓ | ✓ | ✓ |

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| | | | | | |
|---|---|---|---|---|---|
| | reflecting on different groups' posters. | | | | |
| | | **Class participation (10%)** Based on Top Hat and in-class attendance and activities, assessed with a rubric | ✓ | ✓ | ✓ |

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# WRITING COURSE LEARNING OUTCOMES

## FOUNDATIONS OF COURSE DESIGN

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**Writing Course Learning Outcomes**

Course learning outcomes (CLOs) are statements of what students should be able to demonstrate by the end of the course. Well-defined course learning outcomes provide a strong foundation for course design and fostering student engagement, accountability, and alignment with appropriate activities and assessments. (Hamidi et al., 2024; Osueke et al, 2018)

Course learning outcomes follow a general format:

**Audience** + **Behaviour** + **Condition** = **Course Learning Outcome**.

**A** = the audience, will be the people (students) accomplishing the outcome.
**B** = the behaviour, is what is expected of them and is directly related to Bloom's Taxonomy.
**C** = the condition or criteria that extends the behaviour and provides the context of learning.

**Example: By the end of this course, students should be able to formulate a research hypothesis based on a critical evaluation of the current literature.**

**Key Concepts:**

*Bloom's Taxonomy*: A learning theory dating back to 1956 (Bloom et al. 1956) to classify the level and depth of learning into 3 domains: cognitive, affective and psychomotor (Krathwohl, 2002). This theory is commonly used today in higher education.

*Domains of learning*: There are 3 main domains of learning associated with Bloom's Taxonomy to assist in constructive alignment (Krathwohl, 2002):

Cognitive: the foundational knowledge (memorizing, comprehension, application, analysis, evaluation and creating)

Affective: the attitudes, actions, values, biases and interests (receiving, responding, valuing, organization, characterization)

Psychomotor: the physical or motor skills (imitate, execute, perform, adaption, create new movements)

*Transferability of learning*: When writing course learning outcomes consider how the learning can be transferred to new and unique situations.

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**Course Learning Outcomes in Action**

Course learning outcomes can help shape the learning experience through intentional verb selection and wording.

**Further examples:**

- Students should be able to design and create a small applet or application using object-oriented design principles.
- By the end of this course, students should be able to formulate a research hypothesis based on a critical evaluation of the current literature.
- Students should be able to summarize the historical context of development discourse from Colonialism to today.

The three main domains of learning to help structure course learning outcomes: c**ognitive, affective and psychomotor.** Use the following charts to help identify what the target learning is for course learning outcomes

**Cognitive Domain**

The cognitive domain (Bloom, 1956) involves knowledge and the development of intellectual abilities. This includes the recall or recognition of specific facts, procedural patterns, and concepts that serve in the development of intellectual abilities and skills.

| Category | Key Verbs | Examples |
|---|---|---|
| **Remember:** Retrieve relevant knowledge from long-term memory. | tell, list, recognize, describe, recite, locate, label, identify, memorize, define, match, name, outline, recall, reproduce, select, state | Students should be able to: *Locate* different countries on the world map. *Identify* styles of architecture in urban settings, such as downtown Calgary. |
| **Comprehend**: perceive meaning and grasp mentally | explain, describe, clarify, compare, generalize, summarize, extend, paraphrase, represent, exemplify, illustrate, classify, | Students should be able to: *Compare* different artistic painting styles. |

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| | | |
|---|---|---|
| | contrast, convert, distinguish, instantiate, estimate, give examples, infer, interpret, rewrite, arrange, match, paraphrase | *Explain* the formation process of igneous rock. |
| **Apply:**<br>Carry out or use a procedure or process theory in a given situation | solve, show, classify, use, execute, carry out, implement, choose, report, apply, compute, construct, demonstrate, manipulate, modify, operate, prepare, produce | Students should be able to:<br>*Solve* linear equations.<br>*Use* rhetorical strategies to make arguments in writing. |
| **Analyze:**<br>Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose. | analyze, sort, contrast, investigate, separate, differentiate, break down, compare, diagram, deconstruct, illustrate, infer, outline, relate, organize, integrate, structure, calculate, modify, solve | Students should be able to:<br>*Differentiate* between plant and dwarf plant.<br><br>*Sort* a given set of plants by genus or species. |
| **Evaluate:**<br>Make judgments based on criteria and standards | judge, select, decide, debate, justify, verify, argue, assess, prioritize, predict, appraise, conclude, critique, defend, evaluate, estimate, test | Students should be able to:<br>*Debate* the extent to which human activities might affect climate change.<br>*Critique* the methodology section of a research article. |
| **Create:**<br>Put elements together; reorganize elements into a new pattern or structure. | create, invent, design, devise, formulate, hypothesize, produce, generate, plan, construct, compile, compose, organize, write | Students should be able to:<br>*Generate* a business plan based on the clients' needs.<br><br>*Produce* an Individual Program Plan (IPP) for students with a learning disability. |

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## Affective Domain

The affective domain (Krathwohl, Bloom, & Masia, 1973) includes the way we deal with things emotionally, such as feelings, values, appreciation, enthusiasm, motivation, and attitudes.

| Category | Key Verbs | Examples |
|---|---|---|
| **Receive:** Open to experience; willing to listen | ask, listen, focus, attend, take part, discuss, acknowledge, hear, read | Students should be able to: *Listen* to new information with neutrality. |
| **Respond:** React and participate actively | react, respond, seek, discuss, interpret, clarify, provide additional examples, contribute, question | Students should be able to: *Participate* actively in a group by contributing to or building on new ideas. |
| **Value:** Identify values and express personal opinions | demonstrate, differentiate, explain, justify, propose, affirm | Students should be able to: *Demonstrate* sensitivity towards individual and cultural differences. |
| **Conceptualize Values:** Reconcile internal conflicts; develop value system | Build, develop, formulate, defend, modify, relate, prioritize, reconcile, contrast, arrange, compare, propose, verify | Students should be able to: *Prioritize* emergency responses after a disaster. |
| **Internalize Values:** Adopt belief system and philosophy | act, display, influence, solve, practice, propose, revise, defend, organize | Students should be able to: *Revise* judgments and change behavior in light of new evidence. |

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**Psychomotor Domain**

The psychomotor domain (Simpson, 1972) includes physical movement, coordination, and use of motor skills.

| Category | Key Verbs | Examples |
|---|---|---|
| **Imitate:** Copy action of another; observe and replicate | Copy, follow, replicate, repeat, adhere | Students should be able to: *Observe* and *copy* dance steps. |
| **Execute:** Reproduce activity from instruction or memory | Re-create, build, perform, execute, implement, follow | Students should be able to: *Follow* instructions to dissect a shark. |
| **Perform:** Execute skill reliably, independent of help | Demonstrate, complete, show, perfect, calibrate, control, measure | Students should be able to: *Fix* a leaking faucet. |
| **Adaption:** Adapt and integrate expertise to satisfy a new objective | Construct, solve, combine, coordinate, integrate, adapt, develop, formulate, modify, master, illustrate | Students should be able to: *Drive* a vehicle in various weather conditions. |
| **Naturalize:** Create new movement to fit a particular situation or specific problem. | Design, specify, manage, invent, convert, create, fix, generate, plan | Students should be able to: *Create* a new gymnastic routine. |

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**Strategies for writing course learning outcomes**

1. Be specific and use action verbs based on Bloom's Taxonomy.
2. Avoid jargon and being too wordy. Get to the point and communicate what the intended learning is.
3. Keep focused and avoid writing too many CLO's that become a list of topics. Typically, there are 5-8 outcomes in a 3-credit course.

**Try this:**

As you write, revise and interpret course learning outcomes talk through each outcome as if you were explaining it to a student and how it will be assessed. Then answer the question, "Is this the meaning behind the outcome?". Writing outcomes can be repetitive and through the process of alignment outcomes can be adjusted to be aligned with assessments, or vice-versa.

**Further Reading:**

Significant Learning Taxonomy: An alternate to Bloom's Taxonomy, the Significant Learning Taxonomy (Fink, 2003) is an integrated, non-hierarchical taxonomy that includes the human dimension.
https://www.bu.edu/sph/files/2014/03/www.deefinkandassociates.com_GuidetoCourseDesignAug05.pdf

**Artificial intelligence resources:**

"Bloom's Taxonomy Revisited – Artificial Intelligence Tools" by Oregon State University Ecampus is licensed under CC BY-NC 4.0

Boubker, O. (2024). From chatting to self-educating: Can AI tools boost student learning outcomes? *Expert Systems with Applications*, *238*, 121820-. https://doi.org/10.1016/j.eswa.2023.121820

Gonsalves, C. (2024). Generative AI's Impact on Critical Thinking: Revisiting Bloom's Taxonomy. *Journal of Marketing Education*. 1-8. https://doi.org/10.1177/02734753241305980

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**References**

Bloom, B.S. (1956). Taxonomy of educational objectives: The classification of educational goals. Susan Fauer Company, Inc.

Hamidi, H., Hejran, A. B., Sarwari, A., & Edigeevna, S. G. (2024). The Effect of Outcome Based Education on Behavior of Students. *European Journal of Theoretical and Applied Sciences*, *2*(2), 764-773. 10.59324/ejtas.2024.2(2).68

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1973). Taxonomy of educational objectives, the classification of educational goals. Handbook II: Affective domain. New York: David McKay Co., Inc.

Krathwohl, D. R. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory Into Practice*, *41*(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

Osueke, B., Mekonnen, B., & Stanton, J. D. (2018). How Undergraduate Science Students Use Learning Objectives to Study. *Journal of microbiology & biology education*, *19*(2), 19.2.69. https://doi.org/10.1128/jmbe.v19i2.1510

Simpson, E. J. (1972). The classification of educational objectives in the psychomotor domain. Washington, D. C.: Gryphon House.

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UNIVERSITY OF CALGARY
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# PLANNING STUDENT ASSESSMENTS

## FOUNDATIONS OF COURSE DESIGN

AUTHORED BY:
Lorelei Anselmo, MEd., Lin Yu, MEd., Patrick Kelly, MSc.

**Planning Student Assessments**

Once you have established the course learning outcomes, the next step is to determine how well students have met those outcomes. Assessment is an ongoing process, generally composed of two main parts:

- formative (assessment for learning)
- summative (assessment of learning)

**Key Concepts:**

*Alignment*: Assessments need to measure the intended course learning outcomes and to what degree students have met those outcomes. The nature of the assessments impact how students engage with the course (Lizzio et al, 2002; Iannone & Simpson, 2017), and selecting appropriate assessment methods and questions should connect to the course learning outcomes.

*Feedback*: Explicit feedback directs students' attention to areas they can improve on and what they are doing well. Feedback also helps students become self-directed learners and incorporate metacognition/reflection into their own learning (Mannion, 2022).

Formative, continuous feedback has been shown to help develop student metacognition and reflective practice (Irons & Elkington, 2022).

Summative assessments provide a basis for certification/grades, keep students accountable, and an opportunity for further feedback. (Kibble, 2017)

*Prior knowledge*: Assess prior knowledge early in the course to both activate prior knowledge and determine the readiness to integrate new material. Review previous material and integrate self-directed learning and reflection techniques to help students gauge their own learning and progress. (Ambrose et al, 2010)

*Student Self-Regulation***:** Promotes self-regulated learning. When students receive feedback and are engaged in reflection, they can develop their metacognitive skills, allowing them to monitor and manage their learning effectively (Fusion, n.d.).

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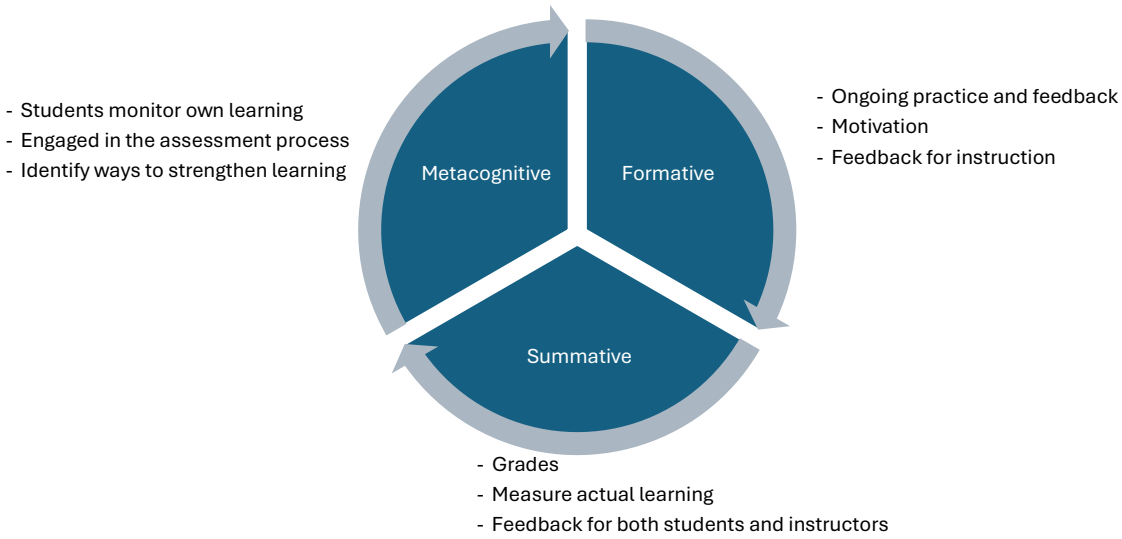
## Types of assessments




### Formative assessment (assessment for learning)

Formative assessment (assessment for learning) is a dynamic and ongoing process that provides feedback to both students and instructors throughout the course.

### Formative Assessment Examples:

- **Quizzes:** Incorporate short, low-stakes quizzes throughout the course to gauge students' understanding. These quizzes can be auto-graded and can help identify areas where students may be struggling.
- **Peer Review:** Encourage peer review and self-assessment. This not only provides additional perspectives but also empowers students to reflect on their work critically.
- **Digital Tools:** Leverage technology for formative assessment. Online platforms and tools allow for instant feedback, interactive simulations, and data analytics that can inform both students and instructors.
- **In class activities:** Not all assessments need to be graded and can take place during a class such as concept mapping, think-pair-share, muddiest point, and jigsaw. (https://www.usf.edu/atle/documents/handout-interactive-techniques.pdf)

### Summative Assessment (Assessment of Learning)

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**Overview:**

Summative assessments are typically administered at the end of a unit, module, or course to gauge the overall learning outcomes and the degree to which students have achieved the stated objectives.

**Examples of summative assessment:**

- **Final Exams:** A common form of summative assessment is a comprehensive final exam that covers the knowledge and skills learned throughout the course. This can include essay questions, multiple-choice questions, and authentic assessments.
- **Term Papers and Projects:** Assigning a major research paper, project, or capstone assignment that students work on throughout the course and submit at the end is a way to assess their cumulative learning.
- **Portfolios:** Summative assessment can also take the form of student portfolios, which compile examples of the student's work over the duration of the course. These may include essays, projects, and other assignments.

**Examples of metacognitive assessment:**

A continued effort for students to reflect on their own thinking and learning strategies such as study habits, task management, and exam writing.

- **Peer feedback**: Students provide each other with feedback on their work or their approaches using guiding questions or rubric. Generally peer feedback is used to inform the student of readability, being on task, or raising questions. Peer feedback may or may not be graded.
- **Reflection:** Students can be prompted to reflect on experiences and their own learning through prompts or guiding questions. In depth reflection can occur in journalling or other graded forms of reflective writing. Or quick reflective activities can happen in class such as minute papers, the muddiest point, think-pair-share or using a classroom response system (e.g. TopHat)
- **Exam wrappers:** Prompting students to reflect on their preparation and performance on an assessment (read more at https://uwaterloo.ca/centre-for-teaching-excellence/node/4521)

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**Student Assessment in Action:**

1. Check with the department/faculty to determine any requirements that must be included in the course (e.g. a midterm with 15%, a written essay, or a final exam is required)
2. Use a variety of assessment methods. A variety of assessment methods provide students with different opportunities to practice and demonstrate their learning while not relying on a certain method. (CAST, 2020)
3. Sequence assessments to establish a flow to the course. Having early low-stakes assessments helps students become familiar with the assessment aspects of the course, while spacing out assessments provides time for students to respond to feedback.
4. Provide choice where possible. Examples of choices include selecting a topic to report on, options to answer a selection of questions on an exam, and choosing which medium to use (such as creating an infographic vs an essay)
5. Be mindful of high-stakes assessments. High stakes can also create high anxiety among students. Strategies such as providing early practice and feedback, and breaking down high-stakes assignment into smaller tasks (ie Final Project => proposal + project)
6. Be transparent with assessment expectations. Communicate expectations to students early in the course and share rubrics with students.

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**Try this:**

Create an assessment blueprint that connects each assessment to its respective course learning outcome. Indicate if the assessment is formative or summative and describe the purpose of that assessment. Plan the schedule and spacing of each assessment to foster meaningful reflection and use of feedback.

| Assessment Item | % | Formative\| Summative | Associated Course Learning Outcomes | Date(s) | Purpose |
|---|---|---|---|---|---|
| Pre-Test | 5 | F | CLO1 | Sept 10 | To evaluate pre-req knowledge |
| In-class quizzes | 20 | F | CLO1, CLO2 | Sept 20<br>Oct 15<br>Nov 8<br>Nov 26 | Based on lectures, discussions, readings. Factual with some application with feedback and peer discussions. |
| Midterm | 25 | S | | | |
| Project | 35 | S | | | Application of theories and critical thinking, problem solving. |
| Reflective paper | 15 | | | | |

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**Further Reading:**

Designing student assessments:
https://taylorinstitute.ucalgary.ca/resources/module/designing-student-assessments

Managing student team projects:
https://taylorinstitute.ucalgary.ca/resources/module/managing-team-projects

https://taylorinstitute.ucalgary.ca/resources/consistent-and-effective-grading

https://taylorinstitute.ucalgary.ca/resources/module/designing-online-assessments/grading-feedback

https://www.cast.org/binaries/content/assets/common/publications/downloads/cast-udltipsforassessment-20200920-a11y.pdf

University of Alberta Centre for Teaching and Learning. (2025). *Assessment design*. https://www.ualberta.ca/en/centre-for-teaching-and-learning/resources/generative-ai/assessment-design/index.html

University College London (2025). *Three categories of GenAI use in assessment*. https://www.ucl.ac.uk/teaching-learning/generative-ai-hub/three-categories-genai-use-assessment

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**References:**


CAST (2020). *UDL Tips for Assessment*. Wakefield, MA: Author. Retrieved from https://www.cast.org/products-services/resources/2020/udl-tips-assessments.

Iannone, P., & Simpson, A. (2017). University students' perceptions of summative assessment: The role of context. *Journal of Further and Higher Education*, *41*(6), 785–801. https://doi.org/10.1080/0309877X.2016.1177172

Irons, A., & Elkington, S. (2022). *Enhancing learning through formative assessment and feedback* (Second edition.). Routledge.

Kibble, J. D. (2017). Best practices in summative assessment. *Advances in Physiology Education*, *41*(1), 110–119. https://doi.org/10.1152/advan.00116.2016

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: implications for theory and practice. *Studies in Higher education*, *27*(1), 27-52. https://doi.org/10.1080/03075070120099359

Mannion, J. (2022) Beyond the grade: the planning, formative and summative (PFS) model of self-assessment for higher education, *Assessment & Evaluation in Higher Education, 47*(3), 411-423, https://doi.org/10.1080/02602938.2021.1922874

Winstone, N. E., & Boud, D. (2020). The need to disentangle assessment and feedback in higher education. *Studies in Higher Education*, *47*(3), 656–667. https://doi.org/10.1080/03075079.2020.1779687



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# TEACHING AND LEARNING ACTIVITIES

## FOUNDATIONS OF COURSE DESIGN

AUTHORED BY:
Lorelei Anselmo, MEd., Lin Yu, MEd., Patrick Kelly, MSc.

## Teaching and Learning Activities

Teaching and learning activities (TLA) provide the bridge between the course learning outcomes and student assessments. The activities throughout a course influence the student learning experience and student engagement.

## Key concepts:

*Alignment*: Select and design activities that support students' achievement of the course learning outcomes and provide opportunities for practice and feedback prior to assessments.

*Active learning*: Focuses on what students need to do to meet the course learning outcomes and involving students in their learning (Børte et al., 2020). Although collaborative activities are a common form of active learning, not all active learning needs to be collaborative.

*Metacognitio*n: The awareness of one's thinking, metacognition can take many forms in higher education from critical reflection, study habits, personal beliefs of learning, learning strategies, approaches to problem solving, to effective collaboration and overall effectiveness of learning plans. (Stanton et al., 2021) Metacognition can be fostered through intentional activities and feedback.

*Authentic learning*: Situates learning in real-world contexts to what the students are learning and doing. Authentic learning has been shown to increase student engagement, collaboration and depth of learning (Chang et al., 2024).

## Teaching and Learning Activities in Action:

Choose teaching and learning activities that align with your course learning outcomes and assessments. These activities provide opportunities for practice and feedback, helping students develop skills and competencies. Selecting the appropriate activities can be challenging, especially when facing practical constraints like class size. Start small by incorporating simple strategies, such as think-pair-share, into your lectures to engage students at their current level. Additionally, consider how different types of activities contribute to student learning through practice, feedback, collaboration, and reflection and gradually implement a variety of activities to challenge students to think, learn and grow. This thoughtful approach can enhance the learning experience and support students in achieving course outcomes.

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| Examples of teaching activities: | Examples of individual learning activities: | Examples of interactive learning activities |
|---|---|---|
| • Lecturing<br>• Videos<br>• Modeling<br>• Thinking aloud while problem solving<br>• Demonstrations<br>• Guest speakers | • Note taking<br>• Reading, watching<br>• Problem solving<br>• Reflection/journal writing<br>• Portfolios<br>• Minute paper | • Think-pair-share<br>• Small group work<br>• Discussions<br>• Brainstorming<br>• Fishbowl<br>• Debates<br>• Role playing |

**Active Learning Strategies**

**Think-pair-share**

Each learner considers the topic/question and writes down some ideas/answers. Then pair up with one other for discussion. After that, share with a wider audience such as another group or the whole class.

**Round**

- Every person takes a turn to make a statement. Useful topics:
- One thing I need to know about…
- Something that I learned today is that …
- One important point (about the topic) is that …

**Case studies**

A story or scenario is presented to the group. Group discuss the scenario or work together on questions/problems to seek answers/solutions.

**Fishbowl**

- One group discusses a topic. The second group observes the discussion and each learner records:
- A partner's contributions (and gives individual feedback afterwards), or
- The important parts of the discussion (may be identification of issues, applications, generalisations, etc., depending on the task instructions)

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**Question and answer session**

This is a useful activity to check students' understanding. A time is set aside for a discussion/answer session. Questions may be submitted in writing at the previous session (inclusive practice to encourage shy students to submit), or they may be oral.

**Brainstorming**

Brainstorming encourages free thinking, open collaboration, and the sharing of diverse perspectives without judgment or criticism. Everyone thinks of as many different ideas as possible. All ideas are accepted and recorded without comment. The goal is to explore as many possibilities as possible, often leading to innovative or unexpected solutions.

**Concept mapping**

Concept Mapping is a visual tool used to organize and represent knowledge or ideas. It helps illustrate relationships between concepts, making complex information easier to understand and analyze. Provide a topic for students to work with and ask students to write on the whiteboard or flipchart. The class/group generates and organizes concepts, ideas, and information, presenting them visually, often in clusters. This activity is better carried out in groups with a display of the results at the end.

'**Ignorance**'

Before the class begin, students consider what they would like to know by the end of the session. They write down some questions – five is a good number to aim for. Some students may like to share their questions, which can be recorded on the board. The students write more questions at the end of the session. These questions are likely to be different from the earlier ones; they should involve a higher level of thinking; there many well be more of them; and they can be a useful basis for further private study.

See https://www.usf.edu/atle/documents/handout-interactive-techniques.pdf

for many more interactive strategies.

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**Try this**: The teaching and learning environments are where the TLA take place. Mutiple environments highlight the fact that learning can take place both inside and outside of the classroom, online or offline. TLA can be divided into two components: **Teaching activities** and **Learning activities**. Teaching activities are what the instructor does to facilitate student learning. For example, during class an instructor might assign readings, do a presentation, lead a discussion, and assign homework. Learning activities are what students do throughout the process. This might include readings, studying, listening to lectures, participating in discussions and group activities, working through examples, completing homework, and preparing for exams. Use the following TLA form to decide which TLA are most appropriate for student learning.

| Course Outcome | Teaching and Learning Activities | Student Assessment |
|---|---|---|
| | Instructor does:<br><br>Students do: | |
| | Instructor does:<br><br>Students do: | |
| | Instructor does:<br><br>Students do: | |

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Authentic assessment: Incorporate authentic learning into the course to foster relevant and meaningful learning experiences. First identify the 'real-world' problem that is aligned with the course learning outcomes. Then plan activities that simulate this problem and provide support for students to engage with the problem and each other. Authentic learning experiences can also be tied to critical reflection and assessments.

**Further reading**

Critical reflection: https://taylorinstitute.ucalgary.ca/resources/module/critical-reflection

Experiential learning: https://taylorinstitute.ucalgary.ca/resources/learning-modules

Team projects: https://taylorinstitute.ucalgary.ca/resources/module/managing-team-projects

Yee, K. 280+ Interactive Techniques. https://www.usf.edu/atle/documents/handout-interactive-techniques.pdf

**References:**


Barkley, E. F. (2010). *Student engagement techniques: A handbook for college faculty*. Wiley.

Børte, K., Nesje, K., & Lillejord, S. (2020). Barriers to student active learning in higher education. Teaching in Higher Education, 28(3), 597–615. https://doi.org/10.1080/13562517.2020.1839746

Chang Y, Choi J, Şen-Akbulut M. Undergraduate Students' Engagement in Project-Based Learning with an Authentic Context. *Education Sciences*. 2024; 14(2):168. https://doi.org/10.3390/educsci14020168

McAlpine, L. (2004). Designing learning as well as teaching: A research-based model for instruction that emphasizes learner practice. *Active Learning in Higher Education, 5*(2), 119–134. https://doi.org/10.1177/1469787404043809

Stanton, J.D., Sebesta, A.J., & Dunlosky, J. (2021). Fostering metacognition to support student learning and performance. CBE – Life Sciences Education, 20(3). 1 – 7. https://doi.org/10.1187/cbe.20-12-0289

Wray, E. (2020). *Rise model for meaningful feedback*. https://www.risemodel.com/



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# COURSE DESIGN WORKBOOK

## FOUNDATIONS OF COURSE DESIGN

AUTHORED BY:
Lorelei Anselmo, MEd., Lin Yu, MEd., Patrick Kelly, MSc.

# Course Design Workbook

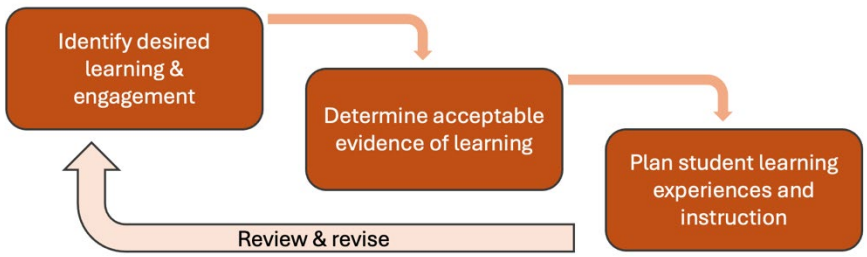
This workbook has questions to reflect on and answer, and guiding prompts to design

### Contextual information

| | | | |
|---|---|---|---|
| **Course Title** | | | |
| **Dates and times** (Lecture / Labs / Tutorials) | | | |
| **Course Description** | | | |
| **Number of students** | | **Modality (In person / Online / Other)** | |
| **Departmental requirements** (assessments, grading, final grades, etc) | | | |

What additional factors are worth noting that will impact the course design?

**Using Backward Design**: Backward design works backwards from the end desired learning for students to identify and align course learning outcomes, instruction and activities, and student assessments together. (ref)

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**Constructive Alignment**: Ensures that assessment, instruction, learning activities and course content are consistent with student-centred course learning outcomes. (ref)

## Stage 1: Identify desired learning outcomes

Course learning outcomes provide the direction for student learning and course design.

<table>
<tr><td colspan="2">Established Goal(s)/Content Standard(s):<br>What relevant goals (e.g., content standards, course or program objectives, learning outcomes) will this course address?</td></tr>
<tr><td>Impactful understanding(s)<br><br>• What are the big ideas or questions for the course?<br>• What key knowledge, skills and capabilities are associated with the profession/career in the field.<br>• What misunderstandings/misconceptions are predictable?<br>• Are there any professional standards or benchmarks that students need to achieve?</td><td>Essential Question(s):<br><br>What intriguing questions will foster inquiry, understanding, and transfer of learning?</td></tr>
<tr><td>Students will…<br><br>Related misconceptions…</td><td></td></tr>
</table>

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**Course Learning Outcomes**

Identify what knowledge, skills and capabilities that students should acquire by the end of the course. Course learning outcomes are measurable actions (key verb) from the cognitive, affective or psychomotor domains. Not all domains need to be included in a course.

**BLOOMS TAXONOMY with key verbs**

**Cognitive domain:** knowledge and the development of intellectual abilities

Remember: Can the students recall or remember the information? [Tell, list, describe, locate, label, identify, memorize, define]

Comprehension: Can the students explain ideas or concepts? [Explain, discuss, describe, compare, generalize, summarize, extend, paraphrase]

Apply: Can the students use the information in a new way? [Solve, show, illustrate, model, draw, classify, use]

Analyze: Can the students distinguish between the different parts? [investigate, separate, defend, predict, differentiate, break down]

Evaluate: Can the students justify a stand or decision? [Judge, select, decide, debate, justify, verify, argue, assess, prioritize]

Create: Can the students create new products or points of view? [Produce, invent, predict, design, devise, formulate, infer, hypothesize]

**Example**:

By the end of this course, students should be able to formulate a research hypothesis based on a critical evaluation of the current literature.

**Affective domain:** values, appreciation, enthusiasm, motivation, and attitudes

Receive: Open to experience; willing to listen. [ask, listen, discuss, acknowledge]

Respond: React and participate actively. [respond, seek, contribute, question, discuss]

Value: Identify values and express personal opinions. [demonstrate, propose, affirm differentiate]

Conceptualize values: Reconcile internal conflicts; develop value system. [formulate, defend, relate, verify, modify]

Internalize values: Adopt belief system and philosophy. [act, influence, propose, defend, organize]

**Example**: By the end of the course students should be able to recognize biases in their own decision making.

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**Psychomotor domain:** physical movement, coordination, and use of the motor skills

Imitate: Observe and replicate an action. [copy, follow, replicate, repeat]

Execute: Reproduce activity from instruction or memory. [re-create, perform, implement]

Perform: Execute a skill reliably and independently. [complete, show, demonstrate]

Adaption: Adapt and integrate expertise for a new objective. [solve, combine, develop, illustrate]

Naturalize: Create a new movement to fit a specific situation or problem. [design, invent, create, plan]

**Example**: By the end of this course students should be able to perform a titration to within provided specifications

*(write the course learning outcomes here) By the end of the course, students will be able to …*

## *Alignment = course learning outcomes + assessment + activities*

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## Stage 2: Determine Acceptable Evidence

Through what performance tasks will students demonstrate the desired understandings, knowledge, and skills? By what criteria will performances of understanding be evaluated?

**Student assessment examples**

| Cognitive domain | Affective domain | Psychomotor domain |
|---|---|---|
| Multiple choice exam questions<br>Matching exam questions<br>Definitions<br>Graphic organizers (such as concept maps or charts)<br>Essay<br>Research paper or report<br>Case study assignment<br>Simulations (with write- up)<br>Observation and analysis<br>Create and implement a survey instrument<br>Self-evaluation<br>Presentations<br>Design projects<br>Create an action plan<br>Portfolio of work | Portfolio<br>Student reflections<br>Journals<br>Minute paper<br>Peer evaluation<br>Infographic<br>Position paper<br>Persuasive argument | Copy<br>Replicate<br>Perform<br>Observe<br>Follow instructions<br>Create |

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The nature of each assessment needs to align to its associated course learning outcome(s). Here are some guiding points to assist you with deciding on assessments for your courses:

1. Select assessment methods that best match the course learning outcomes.
    - Revise either the outcome or assessment to achieve alignment.

2. Use a variety of assessment methods to support diversity in thinking, representation, cultures, strengths, and learning.
    - Consider the course modality (online, classroom, blended), class size, and other factors when selecting appropriate assessments.
    - Include both **formative** and **summative** assessments. Formative provides low stake opportunities for practice and feedback, while summative contribute larger %s to student grades and measure overall learning.

3. Provide opportunities for practice and feedback
    - Students should have the opportunity to practice; the first time they try an activity shouldn't be on the assessment. Practice is part of the formative feedback process.

4. Consider the number of students and assessments:
    - The assessment methods you can use in a large class often differ from those that work well in a small class due to logistics and time constraints.
    - Assessment items need to be manageable for students as well. Consider both your workload and your students. Have you included so many assessment items and approaches that students can't complete them all, or is the workload unrealistic for you?
    - Use this Student Course Time Estimator to help you plan your assessments.

5. Weight assessments to reflect importance and connection to course learning outcomes.
    - For example, if a 20-page paper is only worth 5% of the course grade, students will not put much effort into the paper.
    - Any 1 assessment worth more than 30% of the final grade is considered high stakes. Support students through practice and feedback prior to the assessment. Another strategy is to break down large assessments into smaller chunks, such as a short proposal or draft to provide feedback on.

6. Plan to have sufficient time between assessments for students to incorporate feedback.
    - Plan an early assessment for students to get a feel for the course, grading and feedback.
    - Use this Workload Estimator to help you with the timing of your assessments.

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7. Check assessment and grading policies before the course starts.
    - Does your department use criterion-based or norm-referenced grading practices? What leeway do you have?
    - Review the UCalgary Academic Assessments and Examination policies at *https://calendar.ucalgary.ca/uofcregs/university-regulations/academic-assessments*

8. Create grading rubrics and other assessment material such as instructions, expectations, grading criteria as early as possible.
    - Rubrics help with grading, feedback, and communicating expectations. Creating rubrics is also a valuable method to reflect on the assessment's purpose.
    - Provide exemplars to students where possible.
    - Design transparent assessments: https://taylor-institute.ucalgary.ca/resources/transparent-assignment-instructions-template

**Create an assessment blueprint**

An assessment blueprint helps to see all the assessments in a course at once, and their relationship to each other, the course learning outcomes, sequencing, and the overall learning experience. Include any ungraded items with noting.

| Assessment Item | % of Grade | Formative / Summative | Associated course learning outcome | Date(s) | Purpose |
|---|---|---|---|---|---|
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**Reflective question**: How will students reflect upon or self-assess their own learning?

## Stage 3: Plan student learning experiences and instruction

| What teaching and learning experiences will you use to:<br>• achieve the desired results identified in Stage 1?<br>• equip students to complete the assessment tasks identified in Stage 2? |
|---|
| Where are your students headed? Where have they been? How will you make sure the students know where they are going?<br>What experiences do the learners bring to the unit? How have the interests of the learners been ascertained? Have the learners been part of the pre-planning in any way? What individual needs do you anticipate will need to be addressed?<br>Learning environment: Where can this learning best occur? How can the physical environment be arranged to enhance learning? |
| |

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Once you have highlighted some key activities create an ***alignment chart*** that connects course elements.

| Course learning outcomes | Activities | Assessments | Due dates | Topics and resources |
|---|---|---|---|---|
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## Week-by-Week Course Plan

Creating a week-by-week plan enables you to see the sequencing of the course, and the spacing/flow between assessments, timelines, practice and feedback.

| **Week** | **Topics/Content** | **Associated Course Learning Outcome(s)** | **General notes on activities and assessments** *(practice, feedback, due dates)* |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
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## Stage 4: Reflect and Revise

| Considerations | Comments |
|---|---|
| Is there alignment between outcomes, student assessment and learning activities? Revisions can be made to the outcome, assessment, or activities to establish alignment. | |
| **Course Learning Outcomes:**<br>Does each course outcome use an action verb consistent with levels in Bloom's Taxonomy that can be measured with at least one graded assessment?<br>Be prepared to explain the meaning of each outcome to provide further guidance to students. | |
| **Student Assessments:**<br>Is each assessment clearly aligned with at least one course learning outcomes? | |
| Are the assessment methods valid? (i.e., does each assessment effectively assess the intended course learning outcomes?) | |
| Do the assessment weightings reflect the degree of work required and the importance of the work? | |
| Can the assignments be reasonably completed within the given time frame? | |
| **Teaching and Learning Activities:**<br>Does your course include a variety of teaching and learning activities (e.g., lecture, discussion, case study, group work, projects, presentations, etc.)? | |

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| | |
|---|---|
| Do the teaching and learning activities support student learning of the course outcomes? (e.g., if you want students to apply concepts, do they have opportunities to practice prior to a graded assignment?) | |
| **Mental Health and Wellness:**<br>Approximately how many hours per week are students expected to work on the course? Is this reasonable? | |
| Are there "high-stakes" assessments (i.e., one item weighted 30% or more towards final grade)? How are students supported | |
| How is student mental health supported? (i.e. practice time, specific and timely feedback, appropriate level of challenge, flexibility, relationships, etc) | |

Adapted from: Wiggins, Grant and J. McTighe. (1998). *Understanding by Design*, Association for Supervision and Curriculum Development, ISBN # 0-87120-313-8 (pbk)

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UNIVERSITY OF CALGARY
Taylor Institute for Teaching and Learning

# COURSE DESIGN AND GENERATIVE ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION

## FOUNDATIONS OF COURSE DESIGN

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# Course Design and Generative Artificial Intelligence in Higher Education

### Introduction

This document provides a concise overview of how generative artificial intelligence tools (GenAI) can enhance higher education course design creating effective and equitable learning experiences for our students (Teach Access, 2025). Whether you are beginning to explore AI or seeking to enhance an existing course, this resource provides structured guidance for meaningful, intentional, and ethical integration of GenAI tools.

This resource is organized into three phases—Explore, Engage, and Expand (Kenny et al., 2017) —which may help instructors consider the impact of GenAI as a tool for course design, integrate GenAI tools into their course design, or refine their course design practices.

## Explore: Elements of Effective Course Design

Effective course design in higher education integrates clear learning objectives, aligned assessments, engaging teaching and learning activities, and inclusive pedagogy to support diverse learners.

Gen AI tools may help streamline a course design workflow while incorporating evidence-based practices (Pereira et al., 2024). The framework for integrating GenAI tools into course design emphasizes the importance of formulating clear and aligned learning outcomes. GenAI tools may support instructors to establish and refine these outcomes, ensuring they resonate with the course content and assessment methods while incorporating elements of Bloom's Taxonomy for comprehensive cognitive skills coverage (Pereira et al., 2024; Gonsalves, (2024).

## Engage: Integrating AI into course design

GenAI can assist course design in every stage, depending on where you are in your course development process. We will explore various ways to integrate AI in the essential components of course design: writing learning outcomes, student assessment, and teaching and learning activities.

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**Write Learning Outcomes:**

A well-structured course begins with defining measurable learning outcomes that align with institutional goals and accreditation standards. The integration of GenAI in creating learning outcomes may assist with alignment between learning outcomes, learning activities and assessment.

*Where to get started?*

The following are a few recommendations to engage with GenAI research and learning outcomes:

- **Theoretical Foundations:** Revisit Bloom's Taxonomy as it applies to AI integration (e.g., Oregon State University Ecampus, 2024) to ensure alignment with cognitive objectives from remembering to creating.
- **Research Insights:**
  - Explore studies such as Boubker (2024) that analyze AI's evolution from basic chat functionalities to self-educating systems.
  - Consider Gonsalves (2024), which discusses how GenAI can promote higher-order thinking skills.

**Design Active Learning Strategies for students to use GenAI**

Teaching and learning activities should employ active learning techniques, leveraging technology and evidence-based practices to foster deep engagement. When students have opportunities to practice with GenAI tools through guided learning activities, not only may they increase their GenAI literacy, but learners also recognize the need for critical awareness of the biases and challenges with using these tools (Hawk et al., (2025).

*Where to get started?*

The following are a few recommendations to engage with GenAI research and learning activities:

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**Learning Activities:**

- **Role-playing activities:** GenAI-driven role-playing activities may enhance the learning experience by increasing the capacity to consider and contrast how students approach the scenario (McGovern, 2024).
- **Collaborative Projects:** Encourage group work where AI platforms assist students in team cohesion and collective thinking, supporting learning at multiple cognitive levels (Perifanou et al., 2025).
- **Flipped Classroom Models:** Utilize AI-generated content such as quizzes or interactive modules for pre-class engagement, enabling richer, in-depth classroom discussions (Reinke et al., 2025).

## Assessment Practices and GenAI

Assessments should provide valid and reliable measures of student learning, incorporating formative and summative approaches to enhance knowledge retention and skill development. Assessment practices and GenAI have led to complexities in assessment design, implementation, and managing misconduct (Luo et al, 2025).

*Where to get started?*

The following are a few recommendations to engage with GenAI research and assessment practices:

**Formative Assessments:**

- Use AI-powered assessment management tools, like Gradescope, that assess and sync grades in D2L.

**Future-focused, skills-based assessments:**

- Design assignments that reflect real-world challenges, using AI to generate case studies or projects that require critical thinking and synthesis (Upsher et al., 2024)

**Innovative Frameworks:**

- Employ models like the 6-P Pedagogy (Plan, Prompt, Preview, Produce, Peer-review, Portfolio Tracking) in academic writing (Kong et al., 2024) and synthesis-based assignments (Dguidegue, 2025).

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- Use the PAIR (Problem, AI, Interaction, Reflection) Framework to support students with finding the balance between using GenAI intentionally and not developing an over-reliance on these tools (Acar, 2023).

**Reflective Inquiry:**

- **Descriptive Analysis:** Document the context in which GenAI is used. What tools were implemented? What actions were taken?
- **Case Studies & Examples:**
  - Examine specific AI tools like SMARTIE, designed to help educators develop inclusive course learning activities and rubrics.
  - Analyze cross-disciplinary applications, noting both the benefits and challenges of integrating GenAI in various academic settings.

## Expand: Reflecting, Refining, and Innovating

**Actionable Insights for Future Course Design**

- **Reflect and Iterate:** Use insights gained from exploring and engaging with GenAI to develop actionable strategies for continuous improvement. What adjustments can be made to better integrate GenAI in future courses?
- **Strategic Enhancements:**
  - **Resource Development:** Leverage institutional supports such as the Taylor Institute for Teaching and Learning Resource Library for updated resources on GenAI and teaching and learning.
  - **Professional Development:** Engage with the Centre for Artificial Intelligence Ethics, Literacy and Integrity to stay current on emerging trends and best practices.
  - **Continuous Feedback:** Create systems for ongoing feedback from both instructors and students to guide iterative course refinement.

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## Future Directions and Research Support

- **Curricular Innovation:**
    - Adopt best practices from studies like Salinas-Navarro et al. (2024) that highlight experiential learning with GenAI tools.
    - Explore interdisciplinary applications of GenAI to enhance course design across diverse fields.
- **Ethical Considerations and Integrity:**
    - Foster a culture of ethical inquiry and continuous discussion about the implications of GenAI in education.

## Reflective Inquiry:

- **Implementing Change:** Develop clear, step-by-step strategies for applying insights from your AI experiences into new course designs.
- **Collaboration and Networking:** Emphasize the importance of building networks, such as Conversations about Artificial Intelligence and your Courses, among instructors to share best practices and collaborate on GenAI-focused projects.

### Conclusion

Kenney's et al. (2017) Explore, Engage, Expand framework transforms course design into a dynamic, iterative process. By first exploring the potential of GenAI, then engaging students and faculty through active learning and innovative assessments and finally expanding upon these insights through continuous reflection and improvement, instructors can design courses that are both effective and inclusive.

This approach ensures a reflective and iterative approach to integrating GenAI in course design, leading to more effective and personalized learning outcomes for students.

Contact us: Taylor Institute for Teaching and Learning

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**Supplementary resources:**

Beckingham, S., Lawrence, J., Powell, S., & Hartley, P. (2024). *Using Generative AI Effectively in Higher Education: Sustainable and Ethical Practices for Learning, Teaching and Assessment* (1st ed.). Routledge. https://doi.org/10.4324/9781003482918

Chen, K., Tallant, A. C., & Selig, I. (2025). Exploring generative AI literacy in higher education: student adoption, interaction, evaluation and ethical perceptions. *Information and Learning Science*, *126*(1/2), 132–148. https://doi.org/10.1108/ILS-10-2023-0160

Eaton, S. E. (2024, December 4). Assessing for Integrity in the Age of AI [Online]. DOCEO AI. Calgary, Canada. https://ucalgary.scholaris.ca/items/f3d41824-8a4a-4adc-800e-7d63acdfba6f

Eaton, S. E. (2025). Global Trends in Education: Artificial Intelligence, Postplagiarism, and Future-focused Learning for 2025 and Beyond – 2024–2025 Werklund Distinguished Research Lecture. *International Journal for Educational Integrity*, *21*(1), 12–27. https://doi.org/10.1007/s40979-025-00187-6

Hibbert, M., Altman, E., Shippen, T., Wright, M. (2024, June 3). A framework for AI Literacy. Educause. https://er.educause.edu/articles/2024/6/a-framework-for-ai-literacy

Luo, J. (2024). How does GenAI affect trust in teacher-student relationships? Insights from students' assessment experiences. *Teaching in Higher Education*, 1–16. https://doi.org/10.1080/13562517.2024.2341005

Ruiz-Rojas, L. I., Acosta-Vargas, P., De-Moreta-Llovet, J., & Gonzalez-Rodriguez, M. (2023). Empowering Education with Generative Artificial Intelligence Tools: Approach with an Instructional Design Matrix. *Sustainability*, *15*(15), 11524-. https://doi.org/10.3390/su151511524

**References:**

Acar, Oguz A. (2023). Are Your Students Ready for AI? A 4-Step Framework to Prepare Learners for a ChatGPT World ,*Harvard Business Publishing Education*. https://hbsp.harvard.edu/inspiring-minds/are-your-students-ready-for-ai?

Boubker, O. (2024). From chatting to self-educating: Can AI tools boost student learning outcomes? *Expert Systems with Applications*, *238*, 121820. 1-13. https://doi.org/10.1016/j.eswa.2023.121820

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Dguidegue, Y. (2025). Sociological assessment practices for college students in the age of generative AI: A shift towards synthesis-based assignments. *Learning Letters*, *4*, 32-. https://doi.org/10.59453/ll.v4.32

Gonsalves, C. (2024). Generative AI's Impact on Critical Thinking: Revisiting Bloom's Taxonomy. *Journal of Marketing Education*. 1-6. https://doi.org/10.1177/02734753241305980

Hawk, H., Coriasco, M., & Jones, J. R. (2024). Generative Artificial Intelligence: A Reflexive Thematic Analysis of Nursing Students' Perceptions Following a Guided Learning Activity. *Nurse Educator*, *50*(1), 18–22. https://doi.org/10.1097/NNE.0000000000001736

Kenny, N., Berenson, C., Chick, N., Johnson, C., Keegan, D., Read, E., Reid, L. (2017, October). A Developmental Framework for Teaching Expertise in Postsecondary Education. Poster presented at the International Society for the Scholarship of Teaching and Learning Conference, Calgary, Alberta, Canada.

Kong, S. C., Lee, J. C. K., & Tsang, O. (2024). A pedagogical design for self-regulated learning in academic writing using text-based generative artificial intelligence tools: 6-P pedagogy of plan, prompt, preview, produce, peer-review, portfolio-tracking. *Research and Practice in Technology Enhanced Learning*, *19*, 30-. https://doi.org/10.58459/rptel.2024.19030

Luo (Jess), J., Keung, C. P. C., & Tang, H. H. (2025). Assessment as a dilemmatic space in the GenAI age: mapping and unpacking university teachers' conflicting priorities in assessment. *Assessment and Evaluation in Higher Education*, 1–15. https://doi.org/10.1080/02602938.2024.2444890

McGovern, M. (2024). Using the generative artificial intelligence chatbots of Perpelxity and ChatGPT as a teaching and learning tool for practice teachers and students within social work placement. *The Journal of Practice Teaching and Learning*, *22*(1-2), 38–56. https://doi.org/10.1921/jpts.v21i3.2223

NursingAnswers.net. (September, 2024). *Driscoll's model of reflection*. https://nursinganswers.net/reflective-guides/driscoll-model-of-reflection.php

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Oregon State University ECampus (2024). *Bloom's Taxonomy Revisited*. https://ecampus.oregonstate.edu/faculty/artificial-intelligence-tools/blooms-taxonomy-revisited-v2-2024.pdf

Pereira, E., Nsair, S., Pereira, L. R., & Grant, K. (2024). Constructive alignment in a graduate-level project management course: an innovative framework using large language models. *International Journal of Educational Technology in Higher Education*, *21*(1), 25–21. https://doi.org/10.1186/s41239-024-00457-2

Perkins, M., Furze, L., Roe, J., & Macvaugh, J. (2024). The Artificial Intelligence Assessment Scale (AIAS) : A Framework for Ethical Integration of Generative AI in Educational Assessment. *Journal of University Teaching & Learning Practice*, *21*(6), 49–66. https://doi.org/10.53761/q3azde36

Perifanou, M., & Economides, A. A. (2025). Collaborative Uses of GenAI Tools in Project-Based Learning. *Education Sciences*, *15*(3), 354. 1-23. https://doi.org/10.3390/educsci15030354

Reinke, N. B., Parkinson, A. L., & Kafer, G. R. (2025). A tutorial activity for students to experience generative artificial intelligence: students' perceptions and actions. *Advances in Physiology Education*.1-23. https://doi.org/10.1152/advan.00245.2024

Salinas-Navarro, D. E., Vilalta-Perdomo, E., Michel-Villarreal, R., & Montesinos, L. (2024). Designing experiential learning activities with generative artificial intelligence tools for authentic assessment. *Interactive Technology and Smart Education*, *21*(4), 708–734. https://doi.org/10.1108/ITSE-12-2023-0236

Taylor Institute for Teaching and Learning - University of Calgary. (2025). *Artificial intelligence*. https://taylorinstitute.ucalgary.ca/resources/artificial-intelligence

Teach Access (2025) Where AI Meets Accessibility: Considerations for Higher Education. Every Learner Everywhere. https://www.everylearnereverywhere.org/resources/where-ai-meetsaccessibility-considerations-for-higher-education/

Upsher, R., Heard, C., Yalcintas, S., Pearson, J. & Findon, J. (2024). Embracing generative AI in authentic assessment: Challenges, ethics, and opportunities. In Beckingham, S., Lawrence, J., Powell, S., & Hartley, P. (Eds.), *Using Generative AI Effectively in Higher Education: Sustainable and Ethical Practices for Learning, Teaching and Assessment* (1st ed., pp.106-114). Routledge. https://doi.org/10.4324/9781003482918

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University of Edinburgh. (2024). *Reflection Toolkit - What? So what? Now what?* https://reflection.ed.ac.uk/reflectors-toolkit/all-tools

Werklund School of Education - University of Calgary. (2025). *Artificial intelligence*. https://werklund.ucalgary.ca/teaching-learning/instructor-resources/AI

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