



FALL 2024 | LUNCH & LEARN | DIGITAL LEARNING SERIES

Designing Quality Courses Efficiently with QM Essentials and AI

Facilitated by Dr. Gregory Dement, Executive Director, CTLE

Session Outline



Introductions and Orientation



Backwards Design and QM Standards with AI



ACTIVITY: Working on Common Tasks with AI



DISCUSSION: Strategies for an Efficient Semester



Introductions and Orientation

Our Team

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This is a Hands-On Workshop:



Pull out your devices (laptop preferred)



Login to Microsoft Copilot

URL: <https://copilot.microsoft.com/>



Resource Page | bit.ly/ctle_llw

At Your Tables:

- Activity Guide
- Quick Guide for Generative AI

Backwards Course Design

DESIRED RESULTS

What will students be able to DO at the end of the course?

EVIDENCE

How will learning be demonstrated?

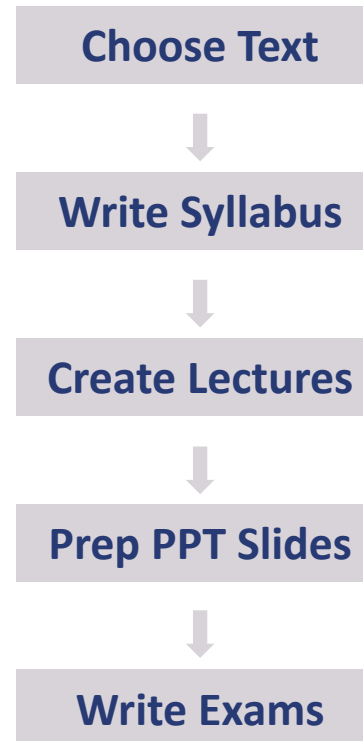
INSTRUCTION

What knowledge or skills are needed to demonstrate learning and how will they be developed?

ITERATION

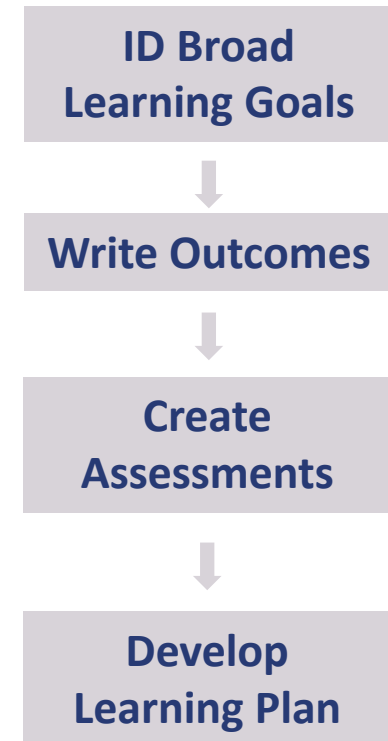
Is the design working as intended?

Standard



Instructor-Centered

Backwards



Student-Centered

Backwards Course Design



STAGE ONE:

Identify Desired Results

- Learning objectives
- Content for learners to experience
- Skills learners need to master
- Big Ideas learners should retain



AI Generate Measurable Outcomes

Aligned QM Standards: 2.1, 2.2, 2.3



STAGE TWO:

Determine Acceptable Evidence

- How will learners demonstrate learning?
- Assessments aligned with learning outcomes



STAGE THREE:

Plan Learning Experience & Instruction

- Aligned course content and materials
- Content delivery and learning activities
Instructional frameworks to use

Backwards Course Design

Backwards Design Step	Description	AI Tasks	QM Standards
1. Identify Desired Results	Define learning outcomes and objectives.	Generate measurable outcomes Create student-centered LOs	2.1, 22 2.3
2. Determine Acceptable Evidence	Develop assessments aligned with LOs.	Develop diverse formative and summative assessments aligned with LOs	3.1
3. Plan Learning Experience & Instruction	Design instructional strategies and learning activities.	Develop content and materials Create aligned learning activities	4.1 5.1
Additional Tasks	Ensure continuous improvement and accessibility.	Gather feedback Check accessibility	8.1 8.2

Step 1: Identify Desired Results



AI Task:



Human Insight:

1

Define Learning Objectives:

Use AI tools to generate initial drafts of learning objectives based on course content and standards.

Review and refine these objectives to ensure they are specific, measurable, and aligned with course goals.

2

Identify Core Concepts:

Analyze course materials to highlight key concepts and themes.

Validate and prioritize these concepts based on their importance and relevance to the course

3

Determine Enduring Understandings:

Suggest potential enduring understandings by analyzing similar courses and educational standards.

Customize these understandings to fit the unique context and goals of your course.

Step 1: Identify Desired Results

Possible Additional AI Tasks:

Content Analysis:

Use AI to analyze large volumes of text and identify key themes and concepts.

Real-World Connections:

Utilize AI to find and suggest real-world applications and examples that relate to your course content.

Cognitive Load Analysis:

Analyze the complexity and quantity of desired results to ensure appropriate cognitive load

Soft Skill Integration:

Suggest ways to incorporate essential soft skills (e.g., communication, teamwork) into discipline-specific outcomes

Metacognitive Skill Development:

Generate ideas for incorporating metacognitive skills into course outcomes

Example Basic AI Prompt - Outcomes



You

Generate clear and measurable learning outcomes for a freshman-level general biology course using Bloom's Taxonomy.



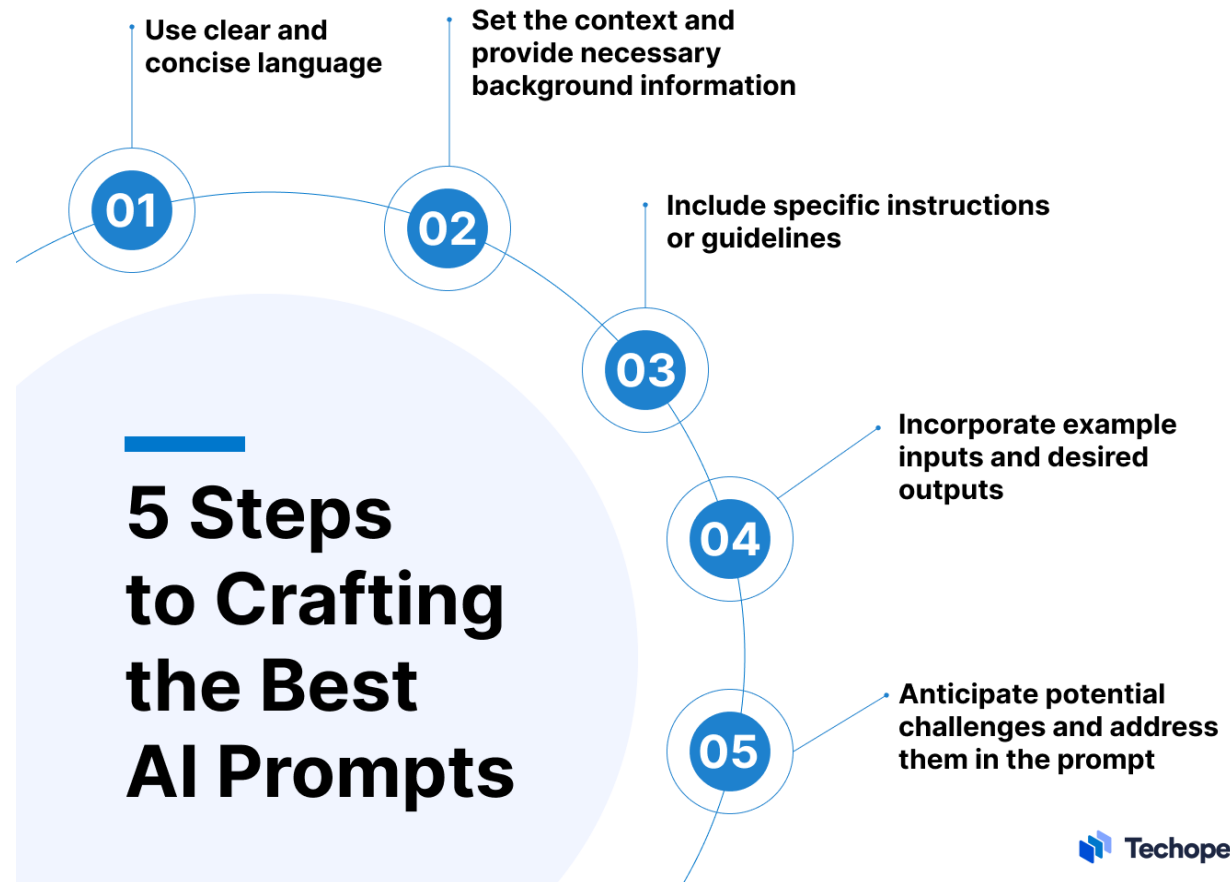
Copilot

Example Response:

- Students will be able to **describe** the structure and function of cell organelles.
- Students will be able to **analyze** the process of photosynthesis and cellular respiration.
- Students will be able to **evaluate** the impact of genetic mutations on protein synthesis.

Tips for Effective Use of Gen AI

- Be specific and provide context.
- Tailor outputs by asking bot to take on personas.
- Give feedback and build on conversations.
- Request examples.
- Verify accuracy.
- Ask bot to suggest follow-up prompts.



Assessment & Bloom's Taxonomy

LEVEL I - REMEMBERING

APPROPRIATE VERBS:

define, describe, find, highlight, identify, label, list, locate, match, name, observe, recall, recognize, relate, retell, select, state

QUESTION TYPES:

- » List the ...
- » How would you describe ...?
- » How would you explain ...?
- » When did ____ happen?
- » How would you show...?
- » Select the ...
- » Which one ...?
- » Who was ...?
- » Why did ...?

LEVEL II - UNDERSTANDING

APPROPRIATE VERBS:

cite, classify, compare, contrast, demonstrate, discuss, explain, extend, infer, illustrate, interpret, outline, paraphrase, predict, relate, summarize

QUESTION TYPES:

- » Explain what is happening ...
- » How would you classify ...?
- » How would you summarize...?
- » Which is the best answer?
- » Which statements support?
- » What is meant ...?
- » How would you compare ...?
- » How would you contrast ...?

LEVEL III - APPLYING

APPROPRIATE VERBS:

apply, build, calculate, categorize, classify, choose, develop, edit, interview, model, organize, plan, represent, translate, utilize

QUESTION TYPES:

- » What examples can you find to ...?
- » How would you organize ...?
- » How would you apply what you have learned to develop ...?
- » What other way would you plan to ...?
- » What questions would you ask in an interview with ...?
- » What elements would you choose to change ...?
- » How would you classify ...?
- » What would result if ...?

LEVEL IV - ANALYZING

APPROPRIATE VERBS:

analyze, appraise, arrange, categorize, discover, dissect, distinguish, divide, examine, investigate, order, prioritize, research, separate, simplify, survey

QUESTION TYPES:

- » What inference can you make ...?
- » What conclusions can you draw ...?
- » How would you categorize...?
- » What evidence can you find...?
- » What is the relationship between?
- » Can you make a distinction between?
- » How would you prioritize ...?
- » Why is it better that ...?

LEVEL V - EVALUATING

APPROPRIATE VERBS:

appraise, assess, compile, convert, critique, deduct, defend, disprove, dispute, estimate, evaluate, hypothesize, improve, influence, justify, predict, prioritize, recommend, revise, transform

QUESTION TYPES:

- » How would you justify...?
- » How would you prioritize ...?
- » What information would you use to support the view ...?
- » Why is it better that ...?

LEVEL VI - CREATING

APPROPRIATE VERBS:

adapt, improve, design, invent, propose, change, develop, solve, combine, elaborate, compile, estimate, modify, compose, create, formulate

QUESTION TYPES:

- » How could you modify the ...?
- » How would you adapt ____ to create different ...?
- » What way would you design ...?
- » What could be combined to improve ...?
- » Suppose you could ... what would you do ...?
- » Can you construct a model that would change ...?

Example AI Prompt - Outcomes



You

You are an expert faculty developer. I need help writing **course-level goals** for graduate students in a course on **cancer biology course**. Please write 6-10 goals that focus on what students should know and **be able to do five years** from now as a result of taking this course. They should be written so that even students who may not be initially excited by the course will view these goals as interesting, relevant to their lives, clear, and understandable. Utilize **Bloom's Taxonomy** to **generate outcomes that are measurable and actionable** at different orders of learning. Use the sentence stem, "Students will be able to..."



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1. Knowledge:

- **Students will be able to** describe the fundamental mechanisms of cancer development, including genetic mutations, cellular signaling pathways, and tumor microenvironment interactions.

2. Comprehension:

- **Students will be able to** explain the role of oncogenes and tumor suppressor genes in the regulation of cell growth and how their dysregulation leads to cancer.

3. Application:

- **Students will be able to** apply molecular biology techniques to identify and analyze cancer-related genetic mutations in laboratory settings.

4. Analysis:

- **Students will be able to** critically evaluate current cancer research literature to identify gaps in knowledge and propose potential research questions or experiments.

5. Synthesis:

- **Students will be able to** design and propose a comprehensive research project aimed at investigating a novel aspect of cancer biology, including hypothesis generation, experimental design, and potential impact.



Activity: Identify Desired Results

Complete **Step 1** on the Activity Sheet

- 1 Tailor Prompt:** Modify bold text and blanks of the provided prompt for your course context.
- 2 Enter Prompt:** Paste tailored prompts into Microsoft Copilot (or alt.)
- 3 Refine Outputs:** Enter follow-up prompts to refine results.
- 4 Reflect:** Discuss reflection questions on side two of activity sheet.

Step 2: Determine Acceptable Evidence



AI Task:



Human Insight:

- | | AI Task: | Human Insight: |
|---|--|---|
| 1 Design Varied Assessment Types | Generate drafts of diverse assessment methods (e.g., quizzes, projects, presentations) aligned with learning objectives. | Select and tailor assessment methods to best fit course content, student needs, and institutional context. |
| 2 Develop Clear Assessment Criteria | Create initial rubrics and scoring guides based on learning objectives and industry standards. | Refine criteria to ensure clarity, fairness, and alignment with course-specific goals and expectations. |
| 3 Align Assessments with Learning Outcomes | Map draft assessments to specific learning outcomes and course objectives, identifying potential gaps. | Verify alignment and adjust assessments to ensure comprehensive coverage of course content and skills while maintaining authenticity and relevance. |

Step 2: Determine Acceptable Evidence

Possible Additional AI Tasks:

Gamification:

Create game-like challenges with achievement systems to track and reward progress across multiple assessments.

Real-World Connections:

Utilize AI to find and suggest real-world applications and examples that relate to your course content.

Design Multimodal Assessments:

Suggest creative ways to assess learning through various modes (visual, auditory, kinesthetic)

Enhance Peer and Self-Assessment:

Develop guided reflection prompts for self-assessment exercises

Enhance Accessibility:

Generate alternative formats for assessments to accommodate different learning needs

Example AI Prompt - Evidence



You

Create 3 different **performance tasks on essay writing** using the Transparency in Learning and Teaching (**TiLT**) **framework** from Mary-Ann Winkelmes. Each task should be extremely **interesting and relevant to FTIC freshman students** and mimic what experts do outside of the classroom in their personal or professional lives. Each task should take **no longer than 1 hour to complete**. Each performance task should allow the student who designs it to demonstrate that they **meet at least three of the most relevant learning outcomes** from your previous output. Please indicate which learning outcomes align with each performance task.



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Task 1: Opinion Editorial (Op-Ed) Writing

Purpose: To develop the ability to create persuasive and well-structured arguments on current issues, similar to what journalists and public commentators do.

Task: Write a 500-word opinion editorial on a current social, political, or environmental issue that you are passionate about. Your op-ed should clearly state your position, provide supporting arguments, and address potential counterarguments.

Criteria for Success:

- Clear and compelling thesis statement.
- Logical organization and flow of ideas.

Relevant Learning Outcomes:

1. **Students will be able to create** well-structured, coherent, and persuasive essays that effectively communicate their ideas to various audiences.
2. **Students will be able to evaluate** sources for credibility, relevance, and bias, fostering their ability to conduct thorough and ethical research.

Task 2: Professional Email Writing

Purpose: To practice writing clear, concise, and professional emails, a skill essential in most professional settings.

Task: Write a professional email to a potential employer or internship coordinator. In the email, introduce yourself,



Activity: Determin Evidence

Complete **Step 2** on the Activity Sheet

1

Tailor Prompt:

Modify bold text and blanks of the provided prompt for your course context.

2

Enter Prompt:

Paste tailored prompts into Microsoft Copilot (or alt.)

3

Refine Outputs:

Enter follow-up prompts to refine results.

4

Reflect:

Discuss reflection questions on side two of activity sheet.

Step 3: Plan Learning Experience & Instruction



AI Task:



Human Insight:

1	Design Engaging Learning Activities	Generate a variety of interactive learning activities (e.g., simulations, group projects, case studies) aligned with learning outcomes.	Select and adapt activities to match the specific course context, student needs, and available resources, ensuring they promote deep understanding and skill development.
2	Develop Instructional Content	Create draft content outlines, lecture scripts, and multimedia presentations based on course objectives and current field knowledge.	Refine and personalize content to reflect instructor expertise, incorporate recent developments, and address specific student needs and interests.
3	Plan for Scaffolded Learning	Suggest a sequence of learning experiences that progressively build skills and knowledge, identifying potential points for formative assessment and feedback.	Adjust the learning sequence to accommodate the pace of student understanding, integrate real-world applications, and provide timely interventions for struggling students.

Step 3: Plan Learning Experience & Instruction

Possible Additional AI Tasks:

Generate Personalized Learning Pathways:

Create adaptive learning sequences that adjust based on individual student progress and preferences

Create Discussion Prompts:

Generate prompts that encourage critical thinking and cross-disciplinary connections.

Generate Real-time Feedback Mechanisms:

Design AI-powered tutoring systems that provide immediate, personalized feedback

Develop Collaborative Learning Tools:

Design AI-facilitated group projects that assign roles based on student strengths

Create Industry-Aligned Skill Development:

Design practical exercises, like case studies, based on current industry trends and practices.



You

You are an expert lesson plan writer, and I'd like you to write an example lesson plan for students **at the freshman level** in college.

The topic of this lesson is antibiotic resistance in bacteria. The length of the class period is 75 minutes. Create two objectives for this lesson, and one that needs to be reviewed. Create an innovative example lesson that is **interactive and engaging**. The lesson should be emotion-rich (Sarah Rose Cavanagh) and **involve movement, novelty, or the senses (Susan Hrach)**. Be specific about **how I will check for understanding and give feedback**. It is important that the students are **active and not passive**. It is also important to **build in intrinsic motivators** such as autonomy, mastery, and purpose.

Example AI Prompt - Instruction



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Lesson Plan: Antibiotic Resistance in Bacteria

Lesson Duration: 75 minutes

Objectives:

1. **Understand the Mechanisms of Antibiotic Resistance:** Students will be able to explain how bacteria develop resistance to antibiotics and identify at least three mechanisms by which this occurs.
2. **Evaluate the Impact of Antibiotic Resistance:** Students will assess the global impact of antibiotic resistance on public health and propose strategies to mitigate its spread.

Review Objective:

- **Review Basic Microbiology Concepts:** Students will review the structure and function of bacteria, including the role of antibiotics in treating bacterial infections.



You

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Example AI Prompt - Instruction



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Lesson Plan Outline

1. Introduction (10 minutes)

- **Hook:** Start with a short, emotion-rich story about a patient who suffered from a drug-resistant infection. This will engage students emotionally and highlight the real-world importance of the topic.
- **Review:** Briefly review basic microbiology concepts, focusing on bacterial structure and the role of antibiotics.

2. Interactive Lecture (15 minutes)

- **Presentation:** Use a dynamic presentation to explain the mechanisms of antibiotic resistance (e.g., mutation, efflux pumps, biofilms). Incorporate visuals and short video clips to engage multiple senses.
- **Discussion:** Pause periodically to ask open-ended questions and encourage students to share their thoughts and questions.

3. Group Activity: Case Study Analysis (20 minutes)

- **Case Studies:** Divide students into small groups and provide each group with a different case study of antibiotic-resistant infections. Each case study should include background information, data, and questions for analysis.



Activity: Plan Instruction

Complete **Step 3** on the Activity Sheet

1

Tailor Prompt:

Modify bold text and blanks of the provided prompt for your course context.

2

Enter Prompt:

Paste tailored prompts into Microsoft Copilot (or alt.)

3

Refine Outputs:

Enter follow-up prompts to refine results.

4

Reflect:

Discuss reflection questions on side two of activity sheet.



Hands-On Activity

Reflect on this activity

- 1** Did you find the Gen AI outputs from this activity helpful? Why or why not?
- 2** What challenges or limitations did you encounter? How did (or might) you address them?



Q&A and Discussion

CTLE Resources



Faculty GenAI Guide

bit.ly/facgenlib



LibGuide

bit.ly/studgenlib



Generative AI Faculty Guide

bit.ly/uhdgenai



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**THANK
YOU**