

# UMCES Guide to Learning Outcomes

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## Learning Outcomes Overview

As a student progresses through their course of study at UMCES, we expect our students to be competent with several specific skills at the conclusion of their graduate degree, we call those our *programmatic learning outcomes*. Learning outcomes are simply the desired competencies we expect of our students at the end of a course of study. UMCES courses are designed to teach students a number of these skills and concepts. What we expect our students to be able to do at the end of a course we teach are our *course learning outcomes*. Course learning outcomes feed into program learning outcomes, which feed into the institutional outcomes to help UMCES achieve its educational mission. The **New Course Proposal form** includes a section on how the course fits in with program learning outcomes.

## Drafting Course Learning Outcomes

Creating course learning outcomes is part of an increasingly popular standard of teaching practice that is based on the premise that the most effective learning occurs when faculty go through a deliberate and iterative process to explicitly decide what they want to teach, determine how they are going to teach it, assess whether the students have learned, and then iterate back to change the course and improve student outcomes. Drafting effective course learning outcomes is an essential part of this process and is best done first when developing a new course, but can be done at any time for existing courses. Course learning outcomes are the “what you want to teach” part of the process and they are simply statements that describe what a student will be able to do by the end of the course. It is important that course learning outcomes are measurable, so that assessment and subsequent course improvement can be carried out. Explicitly communicating the course learning outcomes to students in a syllabus has the added benefit of helping students know what they should be learning, thereby improving the likelihood that they will indeed learn what is intended.

At their core, learning outcomes are:

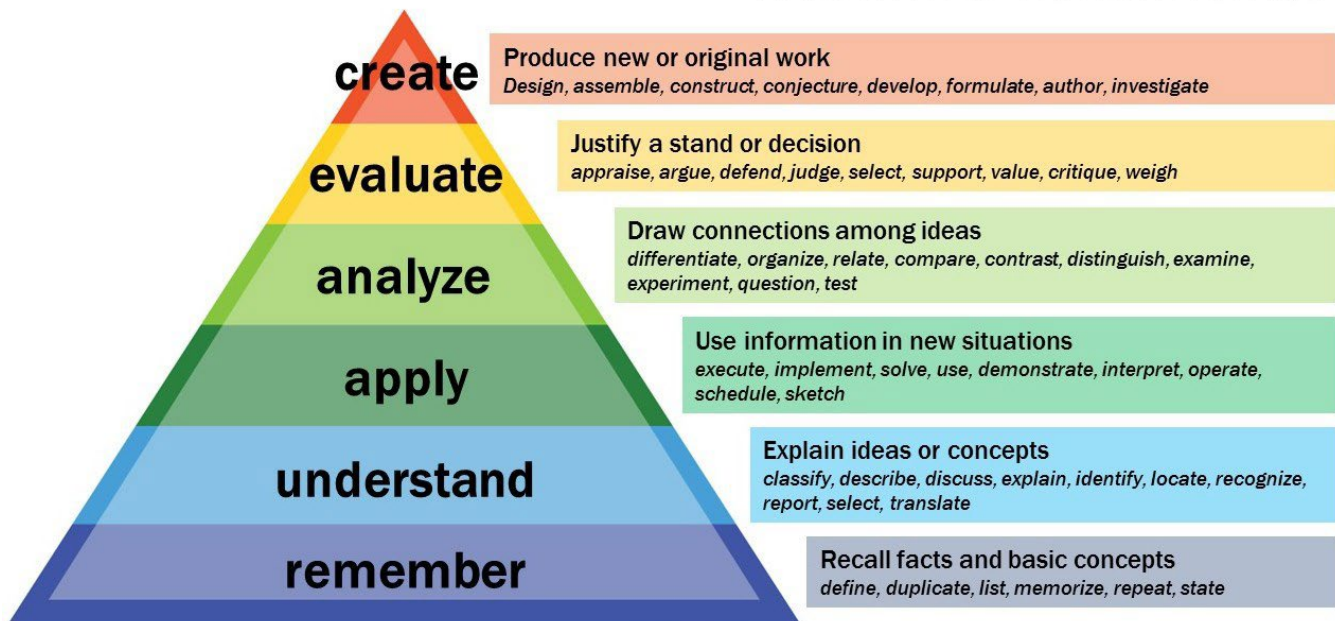
- An action word (see below at Bloom’s Taxonomy for examples of action words)
- Measurable and able to be assessed
- Descriptions of what students should be able to do once they finish your course
- Student-focused rather than instructor focused (i.e. what will the student be able to do at the end rather than what the instructor plans to teach)

We encourage you to look over your current course learning outcomes and adjust them as your course changes over time. All syllabi must include stated learning outcomes.

## Bloom’s Taxonomy

Bloom’s Taxonomy is a good resource for writing effective course learning outcomes. The base of the pyramid includes a more foundational understanding of the subject matter or skills. As you move up the pyramid, the verbs used indicate a mastery of the subject or skills.

# Bloom's Taxonomy



Vanderbilt University Center for Teaching (2015). [Bloom's Taxonomy](#).

This can be translated into a framework of teaching where students are introduced to a topic (remember, understand), given a chance to reinforce their learning (apply, analyze), and develop mastery (evaluate and create). Like learning outcomes, this sort of framework can be applied to a single class period, to an entire course, or to a program of study at any level.

## Example Learning Outcomes

The following are example learning outcomes for a seminar course that used to be taught in MEES called Climate Change and the Biosphere.

1. Explain the significant impact physical environment has on biological systems.
2. Apply important physical concepts and principles to draw conclusions about climate processes.
3. Identify and summarize the important impacts of climate change on systems in their sub-field of environmental science.
4. Effectively communicate knowledge about the significance of current climate-related research in the student's sub-field by writing a research paper

## Utilizing Learning Outcomes

Learning outcomes can improve student learning when they are utilized. There are two key parts of this teaching method:

- Reinforcement: giving the students opportunity to develop the skills required in the stated course learning outcomes
- Assessment: giving the students opportunity to demonstrate their skills in some via assessment. This can be a formal assessment such as an exam or written assignment linked to a learning outcome, or it can be informal, such as instructor observation during a class discussion.

For example, let's use the second learning outcome from the above examples: "Apply important physical concepts and principles to draw conclusions about climate processes."

- Reinforcement: After teaching key physical concepts, the instructor could bring up relevant data and spend class time working to understand as a group by applying those key concepts that were just explained.
- Assessment: Later, on an exam, the instructor might have a map or plot of other data that are relevant to the same physical concepts and ask the students to interpret the data in terms of those key concepts. If half the students got the question wrong, the instructor would self-assess how the concepts could be taught differently or give more practice so that more of the students understood the concept better next time.

Thus, the Learning Outcomes, Teaching, and Assessment loop is closed. Instructors can also use learning outcomes in their course design to ensure that what they really want to teach is what they are actually teaching. For example, when developing a course, an instructor decides that she wants her students to be able to use their new knowledge to develop a research proposal idea and be able to write a proposal. However, the current syllabus has new content scheduled for every class period and does not have any time to teach about proposal writing. The instructor decides to carve out time from lecture to give students guidance (introduction) and to let them turn in a draft for a peer review exercise so that they get some practice with proposal writing and reading (reinforcement) before they are expected to turn in a proposal (demonstration of mastery for assessment).

## **Course Learning Outcomes Assessment Options**

While there are countless ways to assess course learning outcomes, below are a few options that are useful and available to instructors:

- Observation of student discussions and interactions, etc. to gauge difficulties or gaps in knowledge (informal assessment)
- Linking assignments or test questions to specific learning outcomes (quantitative assessment).
  - Excel template with directions for use by instructors (utilized by UMCES faculty)
  - Moodle has the capability of linking learning outcomes to assignments, tests, and grades.
  - Canvas has the ability to link learning outcomes to assignments, tests, and grades.
- An end of semester anonymous questionnaire on how well the students feel that the learning outcomes were met (qualitative assessment)

