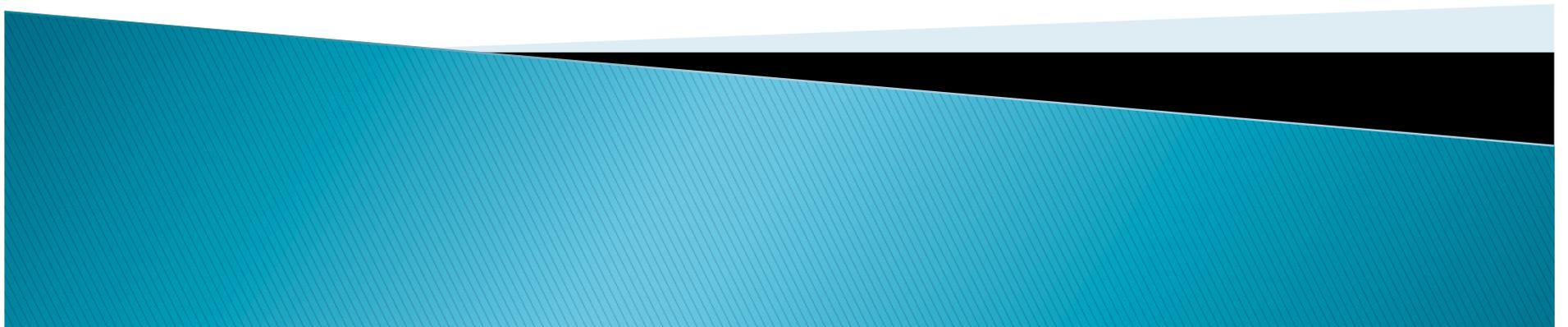


# It's Not (just) About Measurement, It's About Pedagogy

## Goal-Setting in the Teaching-Learning-Assessment Cycle

Michaela Rome, Ph.D.  
NYU Assistant Vice Provost for Assessment



# Overview

- ▶ Purpose of developing goals and objectives
- ▶ Definitions and comparison of goals and objectives
- ▶ Discussion of learning goals
- ▶ Discussion of course objectives
- ▶ Practical approaches to developing goals and objectives
- ▶ Questions



# Why are program learning goals and course objectives important?

- ▶ Focus curriculum and teaching on what is important
- ▶ Guide planning and delivery of instruction as well as design and evaluation of assignments (assessments)
- ▶ Serve as a framework for designing a coherent curriculum
- ▶ Provide a mechanism to ensure that appropriate learning opportunities are offered (identify gaps, redundancies)
- ▶ Keep curriculum current with developments in the field by adding, deleting or revising goals
- ▶ Communicate intentions and expectation to colleagues and students
- ▶ Help students understand the nature of skills acquired and how they can be used in other contexts—during and after college
- ▶ Identify strengths and weaknesses in student performance in order to target assistance and feedback to individual students, class, and program
- ▶ Allow prospective students to choose a program which is aligned with their educational objectives and vice versa
- ▶ Students use objectives to focus their learning, set priorities, gauge their own progress



# What are learning goals and objectives? How are they different?

**Goals:** general statements of student learning; broad, big picture, difficult to measure

- ▶ Knowledge
- ▶ Skills
- ▶ Dispositions
- ▶ Behaviors

that faculty would like students to have gained upon completion of program requirements

**Objectives:** what, specifically, students will be able to do as a result of engaging in the learning activity; aligned with goals, but more concrete and measurable

Objectives are SMART

- ▶ **S**pecific
- ▶ **M**easurable
- ▶ **A**ctionable and aligned
- ▶ **R**ealistic
- ▶ **T**ime-bound

IT MIGHT LEAVE A LITTLE  
TOO MUCH ROOM FOR  
RATIONALIZATION.  
MAYBE YOU SHOULD TRY  
BREAKING IT DOWN TO  
A FEW SPECIFICS...



MOSES and the FIRST DRAFT



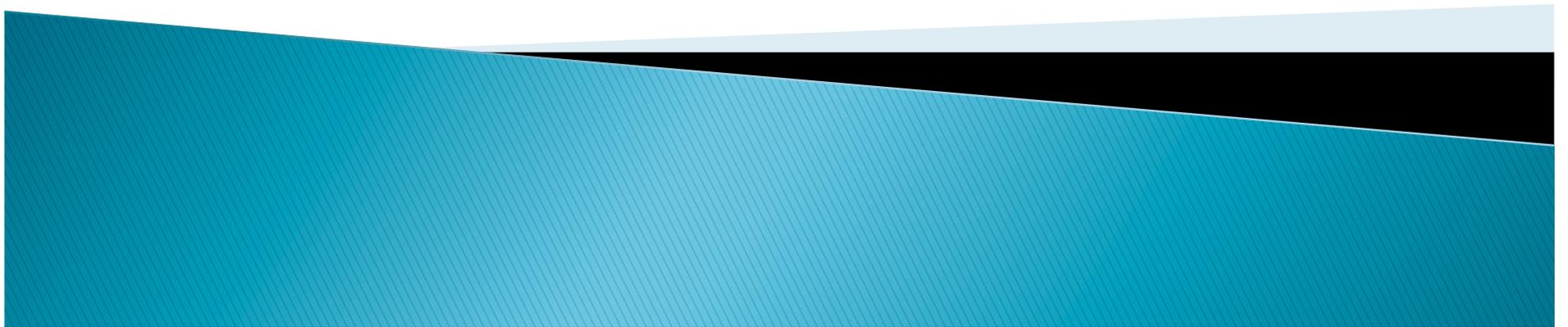
# Don't get hung up on vocabulary

Some other names you will see for objectives include:

- ▶ Learning objectives
- ▶ Behavioral objectives
- ▶ Enabling objectives
- ▶ Terminal objectives
- ▶ Educational objectives
- ▶ Performance objectives
- ▶ Instructional objectives
- ▶ Outcomes
- ▶ Aims
- ▶ Competencies



# Program Goals



# Some Principles for Goal Development

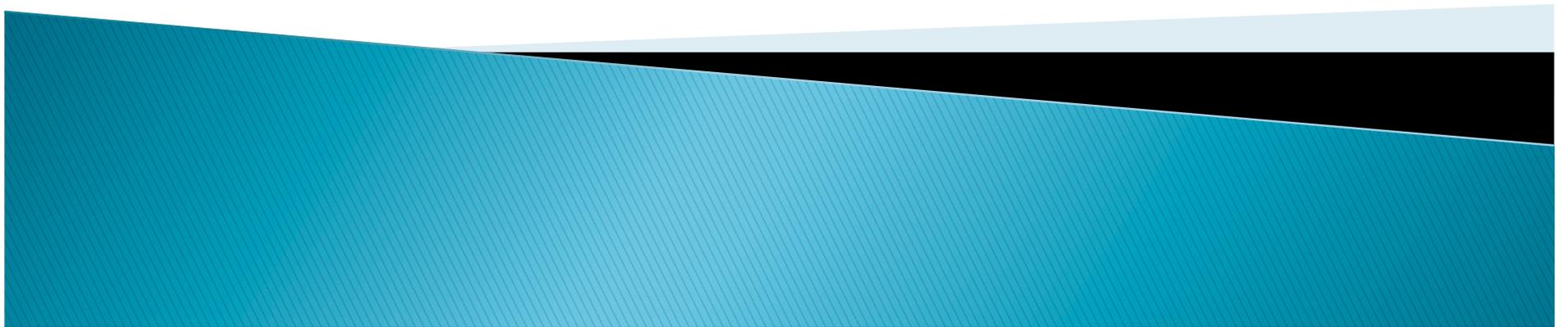
- ▶ Goals should define what you expect all successful graduates to learn, rather than what some subset might learn
- ▶ Articulate goals which describe what students will learn rather than the educational opportunities you will provide (Students will...)
- ▶ Focus on the 4–6 goals that are most important
- ▶ Work with colleagues to ensure that goals develop from broad collegial discussion
- ▶ Revisit goals as often as is appropriate for your discipline. Add, modify or delete goals as warranted, based on changes in the discipline, program mission, changes in requirements for acceptance to graduate school, or other external factors.

# Sample Program Goals

Students earning a B.S. in Applied Physics will be able to:

1. Display intellectual curiosity about and intuition into the processes of the physical universe.
2. Demonstrate a working knowledge of the basic concepts and theories of physics.
3. Display critical thinking skills, especially those skills necessary for the analysis and synthesis of knowledge pertaining to the physical universe.
4. Demonstrate technical proficiency in the principles and techniques of theoretical and experimental physics.
5. Display abilities useful for carrying out independent investigation and originality of thought; i.e. develop creative thinking skills necessary for effectively combining knowledge obtained from differing fields and disciplines.
6. Display effective oral and written communication skills especially with regards to communicating scientific theories and models, data, results, outcomes, and proposals.

# Course Objectives



# Using Bloom's Taxonomy to Develop Objectives

New Taxonomy (Old Taxonomy)	Description	Action Verbs for Objectives
<b>Remembering (Knowledge):</b>	can the student recall or remember the information?	define, duplicate, list, memorize, recall, repeat, reproduce state
<b>Understanding (Comprehension)</b>	can the student explain ideas or concepts?	classify, describe, discuss, explain, identify, locate, recognize, report, select, translate, paraphrase
<b>Applying (Application):</b>	can the student use the information in a new way?	choose, demonstrate, dramatize, employ, illustrate, interpret, operate, schedule, sketch, solve, use, write.
<b>Analyzing (Analysis):</b>	can the student distinguish between the different parts?	appraise, compare, contrast, criticize, differentiate, discriminate, distinguish, examine, experiment, question, test.
<b>Evaluating (Synthesis):</b>	can the student justify a stand or decision?	appraise, argue, defend, judge, select, support, value, evaluate
<b>Creating (Evaluation)</b>	can the student create new product or point of view?	assemble, construct, create, design, develop, formulate, write.

[http://www.odu.edu/educ/roverbau/Bloom/blooms\\_taxonomy.htm](http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm)

# Sample Objectives

- ▶ **Broad:** Students will understand the historically important systems of psychology.
- ▶ **More specific:** Students will understand the psychoanalytic, Gestalt, behaviorist, humanistic, and cognitive approaches to psychology.
- ▶ **Even more specific:** Students will be able to recognize and articulate the foundational assumptions, central ideas, and dominant criticisms of the psychoanalytic, Gestalt, behaviorist, humanistic, and cognitive approaches to psychology.



# Sample Objectives

- ▶ Students will be able to conduct research.
  - “Conduct” = vague
- ▶ **Specific:** Students will be able to identify an appropriate research question, review the literature, establish hypotheses, use research technology, collect data, analyze data, interpret results, draw conclusions, recommend further research.

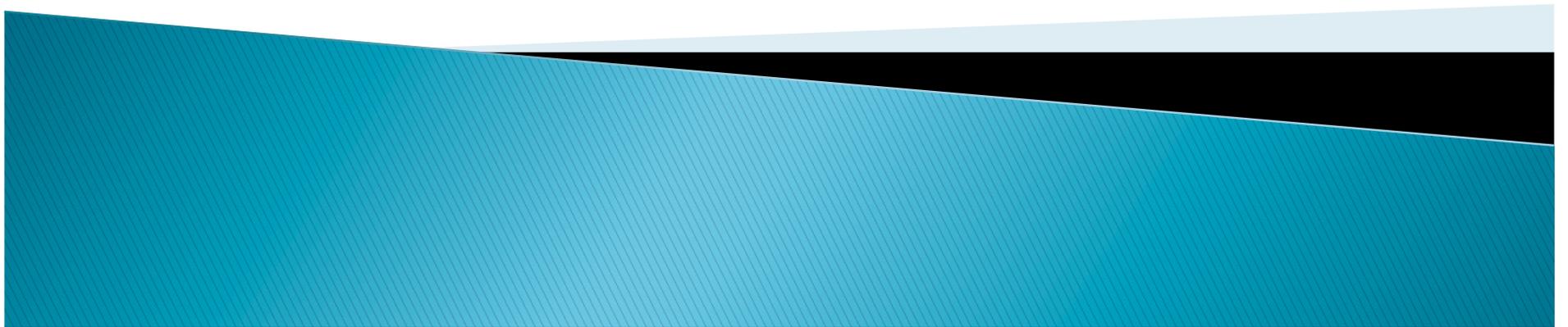


# Sample Objectives

- ▶ Students will develop an appreciation of cultural diversity.
- ▶ Students will be able to summarize in writing their feelings about cultural diversity.
- ▶ Students will be able to summarize in writing their feelings about cultural diversity in New York City using, as appropriate, relevant concepts discussed in class (culture, race, ethnicity, assimilation, ethnocentrism, xenophobia, discrimination, etc.) and providing specific examples from their lives.



# Practical Approaches to Developing Goals and Objectives



# Document Review

Review documents which describe the program's philosophy, background, educational objectives, priorities, expectations for students, etc. Extract learning goals that are implicit in these materials.

- ▶ School/ program mission statement
- ▶ Poly/ program website
- ▶ Self-study documents
- ▶ Annual reports
- ▶ Program reviews
- ▶ Recruiting materials



# Example of Document Review

## Academics

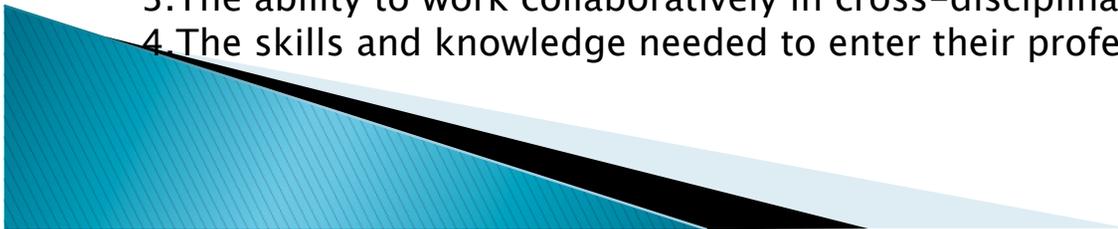
Each year we head deeper into the 21st century, more complex challenges reveal themselves. Solving them will require a new breed of thinkers. It will require **taking intellectual risks** and **cross-disciplinary collaboration**. Mechanical engineers will need to work with biochemists, physicists, and telecommunication experts to develop biosensors that wirelessly transmit environmental test results. Digital media artists will need to work with information technologists, doctors, and civil engineers to create the **hospital of the future**. Computer scientists, mathematicians, and electrical engineers will need to work together to produce a supercomputer to run the **new power grid**.

NYU-Poly academics are focused on **cultivating students' research, thinking, and problem-solving skills** so that they can be members of such teams. Our rigorous coursework is built on the fundamentals; **hands-on projects promote active learning**. Freedom to **experiment with new solutions and unconventional approaches** allows students to **enter their profession or go on to an advanced degree program** with confidence and unmatched experience.

<http://www.poly.edu/academics/>

Upon graduation from Poly, students are expected to have developed:

1. The ability to take intellectual risks via the use of unconventional approaches and experimentation with new solutions
2. The ability to apply research, thinking and problem-solving skills to develop cutting-edge technologies for the future
3. The ability to work collaboratively in cross-disciplinary teams
4. The skills and knowledge needed to enter their profession or pursue an advanced degree



# Website Review (Other Programs)

Use your favorite search engine to search terms such as “applied physics learning goals [objectives, outcomes]” for programs at other schools.

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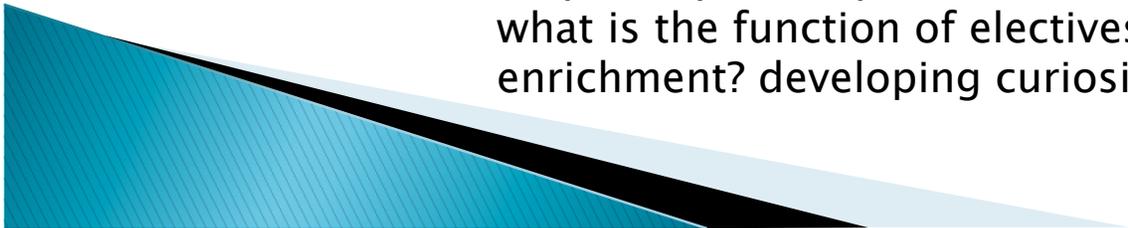
<http://www.xavier.edu/assessment/Applied-Physics-Learning-Outcomes.cfm>



# Review Syllabi, Assignments, Course Descriptions

- ▶ Review syllabi and cull course objectives.\* Look for themes and summarize into 4–6 student learning goals.
- ▶ Compile a list which describes all major assignments and tests\* (via a syllabi review or request faculty to email). What are the skills, knowledge, etc. that students are being asked to demonstrate on these tasks? Identify content areas and action verbs.
- ▶ Review course descriptions\* and extract program goals and/or course objectives

\*especially for required courses, but don't forget about electives: what is the function of electives? specialization? breadth? enrichment? developing curiosity?



## Course Description

Program evaluation is a critical component in designing and operating effective programs. Evaluations supply information to policymakers and program managers that can assist them in making decisions about which programs to fund, modify, expand or eliminate. Evaluation can be an accountability tool for program managers and funders. **This course serves as an introduction to evaluation methodology and evaluation tools commonly used to assess publicly funded programs.**

## Course Objectives

Students are expected to:

- ▶ Create logic models which represent the elements that make up a program
  - Assignment: Develop a logic model for a proposed program
- ▶ Apply their understanding of the concepts, methods and applications of evaluation research to a variety of real-world scenarios
  - Mid-term exam – essay questions re: problem-solving in real-world scenarios
- ▶ Critique the logic, methods, and conclusions of evaluation research
  - Assignment: Write a critique of a published article which presents an evaluation study
- ▶ Propose an appropriate evaluation plan to assess the implementation and effectiveness of a program
  - Assignment: Final Paper Write a 10–12 page proposal for an evaluation of a program

**Extrapolated program learning goal: Students will develop the ability to create and evaluate the efficacy of public policies and programs**

# Professional Standards

List the current professional standards in the field using information from professional societies, accrediting agencies, colleagues at Poly, other universities, in the field, etc.

## ABET Criteria

Student outcomes are outcomes (a) through (k) plus any additional outcomes that may be articulated by the program.

- a) an ability to apply knowledge of mathematics, science, and engineering
  - b) an ability to design and conduct experiments, as well as to analyze and interpret data
  - c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
  - d) an ability to function on multidisciplinary teams
  - e) an ability to identify, formulate, and solve engineering problems
  - f) an understanding of professional and ethical responsibility
  - g) an ability to communicate effectively
  - h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
  - i) a recognition of the need for, and an ability to engage in life-long learning
  - j) a knowledge of contemporary issues
  - k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- 

# Brainstorming Session

Conduct a brainstorming session in a faculty meeting, via a curriculum committee, or have faculty respond via email to several guiding questions (examples below). Summarize the responses into 4–6 student learning goals and have faculty review and approve.

- ▶ Imagine an ideal graduate from your program. What kinds of skills, knowledge, or other attributes characterize that graduate?
- ▶ What is it that attracts students to this program?
- ▶ What value does this program offer a student?
- ▶ How do you know whether your students possess the kinds of abilities, knowledge, skills, and attributes you expect of them?
- ▶ What kinds of assignments or other activities do people in this program use to encourage the kinds of abilities, knowledge, and skills you have identified?
- ▶ What is it that distinguishes this program from related programs in the university?
- ▶ Is there anything about your program that makes it stand out from other similar programs?
- ▶ What kinds of research methodologies are people in this field [program] expected to perform?
- ▶ Oftentimes, disciplines [programs] are defined by ways of thinking. What does it mean to think like a person in this discipline [program]?
- ▶ What kinds of jobs do students in this field generally take?
- ▶ What kinds of skills are appropriate to jobs in this field?
- ▶ How do you know whether students possess those skills?
- ▶ What advantages does a student in this program have on the job?
- ▶ What sorts of speaking and writing do professionals in this field do on the job?
- ▶ What sorts of speaking and writing do students do in their classes?
- ▶ Are there any particular types of communication that people this field [program] are expected to master?

<http://wac.colostate.edu/llad/v6n1/carter.pdf>

# Employer Survey

- ▶ Survey prospective employers to find out what skills, knowledge, behaviors, dispositions they are looking for in employees.

## Other Approaches?



# Questions?

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