Learning Outcomes Assessment – Setting and Measuring Goals

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ABET

- Accreditation Board for Engineering and Technology

ABET Nomenclature

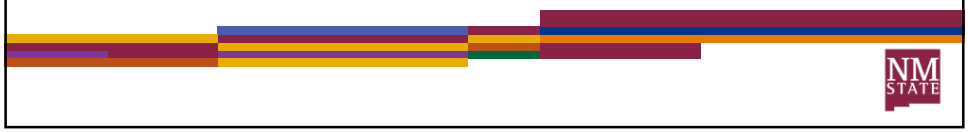
- Educational Objectives
  - Things that graduates can accomplish within 3 to 5 years after graduation
- Learning Outcomes
  - Things that students can accomplish upon graduation

Learning Outcomes

- Must be based on ABET definitions, Title 3, outcomes a through k
- Outcomes should not replicate a-k exactly, but rather should correspond to each outcome

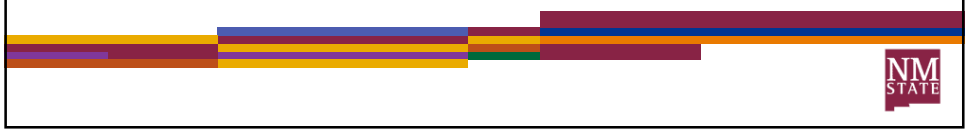
Learning Outcomes

- a) apply math, science & engineering
- b) design and conduct experiments
- c) design a system, component or process
- d) work on multi-disciplinary teams
- e) identify and solve engineering problems
- f) understand ethical and professional duties



Learning Outcomes

- g) communicate effectively
- h) understand the broad impact of actions
- i) recognize the need for life-long learning
- j) know contemporary issues
- k) use modern tools and techniques



Learning Outcomes

- Developed by program faculty with input from government and industry partners (Advisory Committee)
- Measured and tested at regular intervals with results being used to improve the program

Learning Outcomes

- The key to successful outcomes is the ability to directly measure results
- Measurements of outcomes should match predicted goals

Developing Learning Outcomes

- Example learning outcome
  - develop the ability to appropriately collect, analyze, interpret, and apply survey and survey-related data

Developing Learning Outcomes

- Example metric 1
  - 80% of SUR 222 (Plane Surveying) students will receive a grade of “B” or better on their contour map project.

Developing Learning Outcomes

- Example metric 2
  - 80% of SUR 451 (Advanced Survey Measurements, Analysis and Adjustment) students will receive a grade of “B” or better on their network analysis project.

Measuring Learning Outcomes

- Example measurement 1
  - 60% of students received a grade of “B” or better on their contour map
- Metric 1 goal was NOT achieved
  - Increase class and practicum time spent on working on contour maps

Measuring Learning Outcomes

- Example measurement 2
  - 87% of students received a grade of “B” or better on their network design projects
- Measurement 2 MEETS goal
  - Reassess metric to see if it is appropriate

Assessment for Continuous Improvement©

Gloria Rogers -
Rose-Hulman Institute of Technology

Observations and conclusions

- Metrics and measurements need to be well documented and well explained for ABET evaluators (formal process)
- Not all measures need be made in surveying courses but getting those not invested in the program to cooperate is difficult to impossible

Observations and conclusions

- Lower level courses where poor students have not yet dropped from the program are poor choices
- NCEES licensing examination results are now being issued and can be used for measuring learning outcomes