

# ADVANCED NATIONAL EFFECTIVE TEACHING INSTITUTE (NETI-2)

June 1-2, 2016

Washington, D.C.

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NETI-2 is designed to add to the pedagogical expertise of engineering instructors who are knowledgeable about the subjects covered in NETI-1 (course planning, effective lecturing and active learning, and assessment of learning, among other topics). Two instructional approaches will provide the foundation for the workshop content: *cooperative learning* and *inductive teaching and learning* (inquiry-based and problem-based learning). Topics covered for each technique will include definitions, learning benefits and the research base that demonstrates them, implementation suggestions, problems that may arise in implementation and how to avoid them, and how the methods can be used to address ABET Outcomes 3a–3k and promote development of conceptual understanding and high-level thinking and problem-solving skills. Participants will be given opportunities throughout the workshop to plan applications of those techniques in a course they teach. Applications will be accepted on a first-come-first-served basis and will be closed at 50 enrollees.

## Day 1: 8:00–5:00

- **Overview of learner-centered instruction** (active, cooperative, and inductive teaching and learning) **and outcomes-based education** (learning objectives and outcomes, ABET Outcomes 3a–3k)
- **Cooperative learning (CL)**
  - Defining criteria of CL, research base, and structures
  - Forming teams and meeting the defining criteria in lecture, lab, and project-based courses
  - Assessing team products and individual contributions to them
  - Helping students develop teamwork skills
  - Using CL to address ABET outcomes 3a–3k
  - Dealing with student resistance
- **Introduction to inductive teaching and learning.** Inductive methods (inquiry-based learning, project- and problem-based learning, case-based instruction, just-in-time teaching). Similarities and differences, pros and cons, and research base.

## Day 2: 8:00–3:00

- **Inquiry-based and problem-based learning (PBL)**
  - Applying inquiry-based methods to any topic in any course
  - Pitfalls in inquiry-based learning and how to avoid them
  - Applying PBL to any topic in any course
  - Pitfalls in PBL and how to avoid them
  - Using inquiry and PBL to effectively address ABET Outcomes 3a–3k and help students acquire critical and creative thinking skills and deep conceptual understanding
  - Dealing with student resistance
- **Final synthesis and goal-setting exercise**