

**Adaptable Instructional Strategies for Introductory Physics (aISIP)  
Workshop**  
**June 2 – 4, 2011 at Manchester Community College, Manchester, CT**  
Martin Mason, Mt. San Antonio College, Walnut, CA  
Dwain Desbien, Estrella Mountain Community College, AZ  
Tom O’Kuma, Lee College, Baytown, TX

This workshop will introduce and provide participants with experience in using several different curricular approaches to teaching general physics, algebra/trigonometry-based, and calculus-based physics courses. Two approaches in particular will be extensively used during the workshop: a modular approach known as Introductory College Physics/Twenty First Century (ICP/21); and a “supplemental” approach using readily available resources.

The goal of this workshop is for the participants to become familiar with these curricular approaches, develop ways of using the approaches, and to continue working on these approaches after the workshop ends. Each participant will receive extensive ready-to-use curricula materials along with the rights to use them at their institution. In this workshop, participants will work in teams composed of two to four individuals under the guidance of the workshop leaders.

The ICP/21 modules were written with technical students in mind. Each participant will work through selected modules in this new curricula that was developed by a group of two-year college physics professors led by Alexander Dickison and Sherry Savrda of Seminole State College in Sanford, Florida; Marvin Nelson of Green River Community College in Auburn, Washington; and Pearly Cunningham of Community College of Alleghany County in West Mifflin, Pennsylvania.

Each ICP/21 module uses a learning cycles and incorporates many of the teaching techniques, developed by others, that are based on physics education research. Throughout the problem sets and examples in the modules, ICP/21 uses applications found in industry and medicine. The modular CD curriculum allows HS and TYC instructors the opportunity to choose several modules from the curricula that are particularly germane for their students and modify them to meet their particular needs. Each module is activity-based and utilizes a variety of tools to better motivate the student in the learning of key physics concepts. The ICP/21 modules were designed to allow a two year college or high school with limited resources to implement a fully featured activity based curriculum.

Results from Physics Education Research (PER) have indicated that active learning techniques have substantially increased student conceptual understanding, which provides a basis for problem solving with understanding in introductory physics. This workshop will discuss a number of supplemental approaches, including TIPERs (Tasks Inspired by Physics Education Research), ranking tasks, modeling discourse management, and others. This will include small group work on creating sample activities that employ these approaches. This work will be shared and critiqued by the group and workshop leaders. The advantages and weaknesses of these approaches will also be discussed.

The workshop leaders have many years of experience in developing and refining curriculum for introductory physics students. More importantly, the workshop leaders have had extensive experience with the implementation and adaptation of curriculum in a variety of institutions, and for many types of introductory physics students along with the training of faculty in using and developing their own curricula for technology-oriented students.

There will be ample opportunity to share and discuss issues relating to teaching physics more effectively (particularly for those students enrolled in technician/technology education programs), and how to use various strategies, tools, and tactics to overcome problems and barriers to learning at TYCs and HSs. Important issues such as standards, assessment, diversity, and technology utilization will be addressed at various points during the workshop. Discussion and information on the needs of the technological workforce and its connection with the activities of this workshop will also be presented.

The workshop’s local host will be Negussie Tirfessa. Manchester Community College (MCC) is the largest of the 12 Connecticut community colleges; all of which are part of the state system of community technical colleges. MCC serves more than 15,000 students a year. It is located in Manchester, CT about 6 miles east of downtown Hartford.