



<http://www.foundationcoalition.org>

### *From Jeff Froyd, Project Director*

Reports from Share the Future IV Conference in Tempe, Arizona, indicate that the conference generated interest, enthusiasm, and ideas. Overall, the conference attracted 170 attendees. Some participants indicated that the conference reminded them of early Frontiers in Education conferences. Tim Anderson, who organized two workshops for faculty members interested in preparing a CAREER proposal, reported that 70 people participated in these sessions. About 30 people from across the country who are working on concept inventory assessment instruments (<http://foundationcoalition.org/concept>) met to share information and progress. Participants attended their choices from the 27 interactive, two-hour workshops and appreciated the depth to which topics of interest could be explored.

Fourteen faculty members from across the Foundation Coalition (FC) will be meeting in Banff, Alberta, on 23–25 June 2003 to review preliminary reports on curricular change across the FC. Based on over 150 interviews of faculty members on FC campuses and review of many documents, four people are writing preliminary reports on processes through which curricular change occurs and processes that hinder curricular change. Those working on the curricular change project are preparing documents, presentations, and workshops for faculty members, administrators, and institutions to improve engineering education. These tools should allow others to learn from the FC experiences. both positive and neagative.

## Upcoming Events

**Jan 20–May 10 On-line professional development for faculty: Ways of Knowing, Ways of Practice** The University of Wisconsin, with the FC, will offer facilitated dialogue (weekly conversations) on learning for faculty members at many universities. For information, see [http://fc1.tamu.edu/events/news/learning\\_online.html](http://fc1.tamu.edu/events/news/learning_online.html).

**Apr 24–26 Best Assessment Processes V: A Working Symposium** Rose-Hulman Institute of Technology, Terre Haute IN, will teach assessment and its relationship to accreditation. Details are available at <http://dev.rose-hulman.edu/assessment2003/>.

**May 13–14 Freshman-year Innovations Mini-conference**, Purdue University

**May 28–29 Energy Stem Innovations Miniconference**, University of Wisconsin

**Jun 22–25 American Society for Engineering Education Conference**, Nashville, TN

**Nov 5–8 Frontiers in Education Conference**, Boulder CO

# On-line Engineering Course Modules

Free! Open to the public! Use for your classes!



Lee Lowery

The modules we are developing will provide students with the one item that has become scarcer as our engineering courses become increasingly packed with more topics: PRACTICE. We are now including much more technical content than in the past and being forced to cut back on labs to make up for the time lost. Today we have time to show a student how something works only once, if at all, whereas in years past we held comprehensive labs in which they could practice with the material until understood.

Each module is a true, stand-alone training module, with context-sensitive feedback at every stage, covering one part of a course. For example, the influence-lines module covers about 10% of a standard structural engineering course covered by petroleum, aerospace, mechanical, and civil engineering. The module shows how to perform each calculation, gives step-by-step instructions on how influence lines are generated (with error feedback), and provides as many opportunities to practice the procedure on different problems, as the student wishes.

Suggestions for improving and extending the modules are welcome. [Lowery@tamu.edu](mailto:Lowery@tamu.edu)

The underlying hypothesis of the Foundation Coalition (FC) is that, if engineering courses and curricula are restructured using [seven key ideas](#), increases in student retention and learning would result. In addition to preparing summaries about these key ideas, the FC is sponsoring development of engineering course modules that illustrate how faculty members are putting one or more of these key ideas into practice in their classes. Lee Lowery and Don Maxwell are two professors in the Department of Civil Engineering at Texas A&M University who are creating the course modules.

The list of planned modules, together with courses in which the modules would typically be used, is shown at the bottom of this page. The first module that has been put on line is the influence lines module, which would often be used in a course on structural engineering. The module teaches students where to put moving loads on structures to induce the largest force or moment in the structure and provides (like only computers can) infinite opportunities to practice on randomly generated problems. The module is available at

<http://www.foundationcoalition.org/resources/ce/structanalysis/influencelines.html>

## Structural Engineering

Influence lines (on line *now!*)

## Engineering Project Management

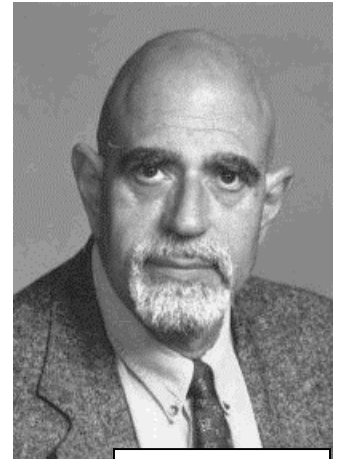
Project controls (will be on line *very soon*)

## Statics

Forces frames  
Forces trusses  
Forces in both statically determinate and indeterminate axially loaded bars  
Torsional forces in statically determinate bars  
Torsional forces in statically indeterminate bars  
Beam reactions  
Shear and bending moment diagrams

## Strength of Materials

Centroids of plane areas  
Moment of inertia of plane areas  
Axial stresses in bars  
Torsional stresses in rods  
Shear stresses in beams  
Bending stresses in beams  
Principle stresses using equilibrium  
Principle stresses using Mohr's Circle  
Radii of gyration of plane areas  
Column buckling



Don Maxwell

The construction project management course modules address project controls. S-curves are used to control cost, scope, and schedule on complex projects. Using these curves and their relative position, students are able to infer construction and schedule variances as they relate to actual work accomplished. While the concept is simple, students have trouble mastering the details of the technique. The modules contain examples of the four possible cases for the students to work through.

These modules are being developed as part of a regular TAMU civil engineering course. More than 100 students enroll for the class each fall and each spring. The course is intended to cover the *project development process* and covers the major activities involved in carrying a concept from inception to implementation.

These modules (about 35, in all) are hosted on the CE department's Web site and will be transferred to the FC Web site over the summer. Module presentation times vary from thirty minutes to two hours, are in active/cooperative learning format, and are available on line: <http://www.foundationcoalition.org/resources/ce/constructionmgmt/constructionmgmt.html>.