Combining Engineering Problem Solving with Programming in One Course to Enhance Learning Effectiveness

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Abstract
A new introductory course for modelling and computation, with main emphasis on computer based problem solving (CPBS) has been developed. Advanced features for enhancing learning effectiveness included in the course are: the use of real life engineering problems as starting points for learning new material, multi-stage problems, where the problem difficulty and the complexity of the computational tool are gradually increased. The programming assignments involve mainly modification of examples, and self-grading with immediate feedback ensures mastery level completion of the assignments.
This course has proven to be very successful in enabling the students to select the software package most appropriate for a particular need and to use three mathematical software packages with wide range of capabilities for computer based problem solving.
The web site of the course is:
http://www.bgu.ac.il/chem_eng/pages/Courses/shacham%20courses/introduction.htm

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