WORKSHOP: ENGINEERING PROBLEM SOLVING (EPS) : A CASE STUDY IN PROCESS-ORIENTED CURRICULUM DESIGN

Friday, July 10th, 2:45pm-3:45pm
LOCATION: CET 213

Facilitators:

Jim Morgan, Texas A&M University
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Abstract:
For the last year, the session leaders have been engaged in regular discussions about a process oriented course for freshman engineering students. Most existing textbooks are repositories of relevant information for freshman students, but offer little guidance on how to support a student-centered learning process. Key features of each chapter in our evolving textbook are:

(1) unique student characters (engineering students) that come from diverse backgrounds, motivations, and ways of being,

(2) chapter content made relevant through connection to pressing global engineering challenges outlined by the National Academy of Engineering,

(3) definition and examples of a half-dozen key process for engineering success (eg. Problem solving, design, professional ethics, teamwork, communication, and experimental data analysis), and
(4) guided discovery activities aligned with a common activity design format.

In this session we will summarize the status of our course design & the associated textbook. We also hope that it will stimulate dialogue about how the freshman experience in all disciplines can benefit from balanced attention to process and content.

Learning Outcomes

1. Describe two similarities and two differences between the envisioned EPS book and the 4th edition of FOL.
2. Assess transferability of knowledge table elements for a selected chapter in the 4th edition of FOL to another course.
3. Catalyze productive discussions after the session about leveraging existing process oriented curricula in creating new curriculum materials.

Facilitation Plan:

1. Round-robin introductions focusing on past participant experience in designing process oriented curricula. Form birds-of-a-feather groups around interest in foundations courses in different disciplines. (5 min)
2. Overview of 4th Edition of Foundations of Learning. (10 min)
3. Overview of planning for Engineering Problem Solving. (10 min)
4. Small Group Discussion on transferability of knowledge Table elements to a specific course context. (15 min)
5. Large Group Reporting—SII format. (10 min)

Resources:

FOL Course Design Materials: www.pcrest2.com/fol4/index.htm

Tentative Chapter Line-up for Engineering Problem Solving (EPS)

Introduction to Engineering (Engineer of 2020 & NAE Grand Challenges)

Strengthening Learning in Math, Science, & Engineering (lifelong learning)

Data, Math, and Graphical Analysis

Problem Solving

Communication

Teamwork

Design Process

Engineering Tools

Professionalism and Ethics

Overview of Engineering Disciplines (also interdisciplinary opportunities)

Self Assessment/ Continuous Improvement