

Opportunities and Challenges

Workshop participants were asked to reflect individually on the opportunities and challenges presented by the prospect of a new undergraduate curriculum in chemical engineering. They then briefly discussed these in their groups. The list below is compiled from reports of these discussions:

- professionalism is important focus for chemical engineers
 - apply ChE tools to problems in other professions' areas.
 - identity of the chemical engineer: other professions are going into chemical engineering areas. Will we remain a distinct and pertinent profession?
 - societal implications - good to have students engage this within ChE
 - design is learned in industry - economic, technical, and society concerns are all important in design
 - ABET and industry input needed in curriculum change.
-
- there are many opportunities today for new, multidisciplinary developments - but how NOT to fracture and specialize the curriculum into tracks? It is important to maintain a core.
 - the curriculum is too big for time available; therefore, we must identify the core, and areas to keep (some things must be omitted)
 - is it time to become a 5-year curriculum?
 - what is wrong with 1970s engineering science core? It is already distinct for a ChE. Suggest we keep it and add new things - a process of incremental change.
 - The best of traditional curriculum becomes a 2nd level of enabling sciences (e.g., thermodynamics)
 - how to add bio-science to curriculum?
 - are our students ready for the new content topics?
 - Is undergraduate preparation sufficient for advanced molecular theory? Can the chemistry departments help us? What are they doing for their students in these areas?
-
- how to connect with first year students?
 - how can smaller departments retool with limited resources and new topics?
 - research in to the classroom. How to do?
 - should we restructure existing courses by the newly proposed organizing principles as an experiment?
-
- academic reward structure favors research over instruction/curriculum activities
 - federal audit of research therefore affects education/research connection
 - NSF has emphasized education, but not at the undergraduate level (they have rather focused on K-12). Convince NSF that curriculum development for undergraduates is a valid career activity for university faculty.