University Materials Council

TMS Materials Science and Technology Meeting: New Orleans Marriott
September 26/27, 2004

Minutes

The Future of UMC

It was generally agreed that the primary role for UMC should be as a voice and advocate for Materials education. That, in addition to a forum for discussion of undergraduate and graduate issues in Materials Science, the group would become proactive and lead and become recognized by other government groups and professional societies as the source of information and knowledge on the current status and future of Materials Education. It was also agreed that this should be aggressively pursued. UMC should be the group that develops strategy and reports on issues related to Materials Education.

Issues related to the role of UMC as the Voice of Materials Education were:

- Define future vision/identity for Materials Departments
- Develop Curriculum of future
- Define impact of globalization
- Develop a focus for engineering with materials
- Develop relationships with governmental bodies and professional societies to advance educational objectives

The UMC will approach various professional organizations such as TMS, NMAB, ASEE, ABET, MRS, etc after we have completed the tasks outlined below. The following tasks were the result of significant discussion and will be reported upon by the Task Forces at our next meeting.

Task Force #1

The first task force volunteered to develop a definition of a Materials Science and Engineering department that reflects current trends, globalization, and ABET (i.e., our role in defining design, etc as it pertains to MatSE) and to outline a strategy for the UMC to be a voice for Materials Education.

Ian Robertson (chair), Raj Bordia, Dave Clark, Gary Messing, Grant Norton, John Rabolt, Bob Snyder

Task Force #2

Task force 2 will develop a response to the following question: What are the unifying features of our discipline. This group should develop a vision of the future that articulates an enduring identity for Materials. This task force will also look into the potential for rewriting the Flemings report on Materials from the 90's.

John Halloran (chair), Dave Clark, Peter Davies, Sungho Jin, Mark Plichta, Bob Snyder

Task Force #3

Task force #3 will develop a one page description of UMC for communicating with external agencies such as NMAB, funding agencies, and professional organizations.

Alan Cramb (chair), Dave Clark, John Halloran, Alex King, Gary Messing, Peter Vorhees

Task Force #4

An outcome from the discussion was the need to develop a national CD for recruiting. A task force was created to outline what will be required to develop a national CD.

Gary Messing (chair), Raj Bordia, Alex King, John Morrall, Steve Pilgrim, Mark Plichta. It was recommended that Gerry Liedl be involved.

ABET – There was an emotional discussion about recent ABET actions, the burden of reporting, and ABET's interpretation of DESIGN. It was decided UMC needs to give ABET a more flexible definition for Design as it pertains to Materials. Also, UMC needs to meet with the review board (TMS, MRS, ACerS) about this definition. We need to better understand how the reviewers are trained.

Task Force #5

Define design as it relates to MatSE programs. Review training procedures and documents used by ABET and suggest improvements. Develop a document that describes the Materials Science view of design that includes research projects in the final year.

Ian Robertson (chair), Raj Bordia, Alan Cramb, Suriya Kalidindi.

Next meeting to be in the Spring of 2005, in Washington, DC.

Meeting Agenda

The Future of UMC (G. Messing, discussion leader)

- What should be the role of UMC?
- Are we comfortable with what we do?
- Should we be part of a society?
- Should UMC be a recognized body outside of the department heads?
- Where are we going strategically?
- What is driving our discipline?
- How should UMC interact with the Materials Societies and ASEE?

Graduate Program Discussion (A. Cramb, discussion leader)

- Analysis of Biomaterials programs in North America
  - John Morral, Ohio State
- How does one include the broadening of our field within the core curriculum or is there no need for a core?
- What are the current trends in qualifying doctoral exams? Are they necessary?
- What is the relationship between our curriculum and the likely career paths of our grads? Is this important?
- Can or should we make our graduate curriculum/experience more attractive to US students?
- Should we include opportunities for our grad students in business, education, entrepreneurship, etc, as part of the grad experience?
- Is a thesis necessary for a PhD? What are people accepting for the thesis requirement?

TMS Education Committee

- Discussion of TMS Career Resource Center
  Gerald Leidl

Undergraduate Program Discussion (Robert Snyder, discussion leader)

- How are we broadening the undergraduate curriculum to include soft materials, bio, etc.?
- How do we maintain a unique MSE major when there is increasing overlap with other disciplines, especially in soft materials/bio?

- What is core material in an undergraduate curriculum? If we broaden what must be left out?
- Abet- How do we feel about the abet requirements – Ian Robertson
- Abet – can we develop a list of timing, etc.
- How well do our undergraduate curricula/experiences match with our students likely career paths, available jobs, etc.?
- What type of design experiences are most valuable and appropriate for our undergraduates?
- What should constitute "capstone design" for BS level materials students? What is the difference between "design" and "research" experiences?
- What guidance should be given to ABET materials program evaluators about design[1]?

[1] ABET Criteria for 2004-2005 require that "Students must be prepared for engineering practice through the curriculum culminating in a major design experience based on the knowledge and skills acquired in earlier course work and incorporating engineering standards and realistic constraints that include most of the following considerations: economic; environmental; sustainability; manufacturability; ethical; health and safety; social; and political." and it states that "Engineering design is the process of devising a system, component, or process to meet desired needs. It is a decision making process (often iterative), in which the basic sciences, mathematics, and the engineering sciences are applied to convert resources optimally to meet these stated needs." How should the less technical aspects be incorporated?

Attendance:

Alan Cramb	Carnegie Mellon	Cramb@cmu.edu
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