Materials Engineering Course Design and Improvement for Effective Research Based Learning Environment
Magesh Thiyagarajan
School of Engineering and Computing Sciences, Texas A&M University – Corpus Christi

Abstract
The effective research based design and improvement elements of the new undergraduate engineering course Materials Science will be presented. It includes student centered interactive learning approaches and student-produced case studies, interactive hands-on lab projects with demonstrations, in-class research projects integrated with faculty research and exposure to writing technical reports.

Interactive hands-on Activities
Students motivation and interest level has been observed to increase drastically when they are offered hands-on and interactive learning through building prototypes, hands-on experience with tools and experiments.

Group Thinking & Activities
Group activities promotes collective thinking and knowledge exchange and improved metacognition and efficient learning: Group Discussions, projects, collective data analysis.

Integrating Research & Education
Access to research facilities is rate for undergraduate students. Students showed great interest in the class especially when they are offered research experience, through lab tours, lectures, mini-research projects and experience on writing journal type research articles and literature review.

Use of Technology
Students enjoy learning new technologies: library database search, youtube videos, BlackBoard, online quizzes, recording student presentations, online books and chat discussions

Student Learning

Resources Applied
1. Shaping the future 1998, National Science Foundation.

Contact
Dr. Magesh Thiyagarajan, Ph.D.
Director of Plasma Engineering Research Lab (PERL)
Assistant Professor of Engineering
Texas A&M University – Corpus Christi
6300 Ocean Drive, Unit 5797, ST 222D
Corpus Christi, TX 78412
Phone: 361-825-2144; Fax: 361-825-3056; Email: magesh@tamucc.edu
http://sci.tamucc.edu/~magesh

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Student Learning

- Faculty Teaching Style
- Interactive hands-on Activities
- Peer Evaluation
- Use of Technology
- Research Integration
- Group Thinking & Activities

Faculty & Innovative Pedagogies
Learning Environment
Student Learning