ENGINEERING

* Abdel-Qader, Ikhlas. "**An Undergraduate Research Mentoring Model in Digital Signal and Image Processing**." International Journal of Electrical Engineering Education Vol. 41 (2004): pp. 146-302.

This work presents a research-mentoring framework to train undergraduate students in a hands-on setting in the area of digital signal and image processing (DSIP). It is intended to encourage undergraduate students to pursue research and to add to their knowledge in information technology and enhance their active-learning and problem-solving skills.

http://www.library.gatech.edu:2048/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a9h&AN=14860816&site=ehost-live

* Abudayyeh, Osama. "**Undergraduate Research Mentoring Model in Construction Engineering and Management**." Journal of Construction Engineering and Management Vol. 129 Iss. 1 (2003): pp. 65-69.

The construction industry is a major player in the nation's economy. The complex nature of the construction industry, coupled with the challenges of global competitiveness and hanging regulatory requirements, has created the need for providing higher levels of education, experience, and training for construction professionals. An essential and integral component of the required education and training must be the research training of undergraduate civil and construction students, encouraging them to pursue advanced education and research careers in this area. With this in mind, the writer developed a Research Experiences for Undergraduates (REU) summer program at Western Michigan University that focuses on construction engineering and management issues and problems. This construction-oriented undergraduate research training program is the first REU site in the United States to be funded by the National Science Foundation. This paper will describe the structure of the REU program, the types of activities undertaken by the REU participants, and the results of the program evaluation and assessment.

http://scitation.aip.org.www.library.gatech.edu:2048/getpdf/servlet/GetPDFServlet?filetype=pdf&id=JCEMD4000129000001000065000001&idtype=cvips&prog=normal

* Best, Aaron A., et al. "**Models of Interdisciplinary Research and Service Learning at Hope College**." Council on Undergraduate Research Quarterly Vol. 28 Iss. 2 (2007): pp. 18-23.

At Hope College, we are supporting interdisciplinary research and teaching. To give a better sense of these accomplishments and the challenges that interdisciplinary research presents, we present two specific examples of Howard Hughes Medical Institute (HHMI) supported interdisciplinary research teams at Hope College: the Interdisciplinary Research Program in Bioinformatics and Microbial Genomics team and Nursing and Engineering in International Development team.

http://www.cur.org/Quarterly/dec07/Winter07Hope.pdf

* Coppola, Brian P. "**Full Human Presence: A Guidepost to Mentoring Undergraduate Science Students**." New Directions for Teaching and Learning Vol. 2001 Iss. 85 (2001): pp. 57-73.

Mentoring represents a new mode of professional development for the sciences. Mentoring in the sciences can also assure that the next generation of scholars will help break the cycle of perpetuating a narrow, and increasingly untenable, definition of education. Various examples of mentoring are presented.

http://www3.interscience.wiley.com.www.library.gatech.edu:2048/journal/89016483/issue

* Gates, Ann Q., et al. "**Meeting the Challenge of Expanding Participation in the Undergraduate Research Experience.**" Frontiers in Education Conference, 28th Annual.

The benefits of working in a research group are clear: students develop domain expertise, gain an understanding and appreciation of the research process and its practice, and acquire team, communication, problem-solving and higher-level thinking skills. Students with this experience are better equipped to make informed judgments about technical matters and to communicate and work in teams to solve complex problems. Clearly, this type of research experience must be made available to a broader population. This paper discusses how the Systems and Software Engineering Affinity Research Group model provides a socialization and infrastructure mechanism that supports the development and management of large research groups that engage undergraduate and graduate students with a wide range of skill levels and experiences in research and projects. This nonhierarchical model integrates students into both a small research group and the encompassing large research group and uses structured activities to develop their technical, communication, group and research skills.

http://stemrc.aihec.org/NASASRE/SREFACULTY/Shared%20Documents/ExpandingUndergraduateResearch.pdf

* Killeen, Timothy L. "**Mentoring Interdisciplinary Undergraduate Courses**." New Directions for Teaching and Learning Vol. 2001 Iss. 85 (2001): pp. 95-108.

Within a multidisciplinary context, mentoring can improve student learning and raise levels of interest in the sciences. Such an approach can even be used in large class settings where the use of faculty teams and new instructional technologies can be applied.

http://www3.interscience.wiley.com.www.library.gatech.edu:2048/journal/89016483/issue

* Marra, Rose M., and Pangborn, Robert N. "**Mentoring in the Technical Disciplines: Fostering a Broader View of Education, Career, and Culture in and Beyond the Workplace**." New Directions for Teaching and Learning Vol. 2001 Iss. 85 (2001): pp. 35-42.

Examples of mentoring in engineering are provided as models for how to relate to students beyond the traditional classroom format. Mentoring expands the opportunities to interact with students and provides rewards for both students and the faculty mentors.

http://www3.interscience.wiley.com.www.library.gatech.edu:2048/journal/89016483/issue

* Merkel, Carolyn Ash. "**Undergraduate Research at the Research Universities**." New Directions for Teaching and Learning Vol. 2003 Iss. 93 (2003): pp. 39-54.

Snapshots of undergraduate research programs at research universities offer models and ideas as benchmark programs. In this chapter, the author describes the undergraduate research culture and draws a picture of undergraduate research at four research universities, including Caltech, MIT, Rutgers, and the University of Washington, all of which exemplify strong undergraduate research cultures. The information was gathered in a study done for the Association of American Universities in 2000. The purpose of the project was to characterize undergraduate research at these institutions to identify issues, questions, opportunities, and barriers affecting undergraduate research in the sciences and engineering and in the arts and humanities. Close to two hundred administrators, faculty members, and students were interviewed, and the snapshots of undergraduate research have been developed from these conversations.

http://www3.interscience.wiley.com.www.library.gatech.edu:2048/journal/104527791/abstract

* Sukumaran, Beena, et al. "**Engineering Clinics: An Integration of Research into the Undergraduate Engineering Curriculum**." Council on Undergraduate Research Quarterly Vol. 26 Iss. 3 (2006): pp. 115-121.

This article describes Rowan University's eight semester course sequence, from freshman to senior year, called the Engineering Clinics. The Clinics are designed to address the challenge of including more design into the curriculum. Engineering clinics allows students to practice a wide range of engineering skills in a multidisciplinary environment while honing their design skills throughout their four-year career. Rowan University has found that it has enhanced retention of female engineering students to an average of 69% 6-year graduation rate for Rowan's women engineering students (national average is between 30 and 46%). In addition, they have shown an increase in interest of attending graduate school.

http://www.cur.org/Quarterly/Mar06/Mar06Sukumaran.pdf