

Delivering a Complete 2-Yr Engineering Science Curriculum in Asynchronous Mode on the Web

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Abstract - *The Engineering Science (ES) Department at Broome Community College (BCC) studied implementation of its entire curriculum in the Asynchronous Learning (ASL) mode while participating in the National Science Foundation (NSF) sponsored Beta Coalition during the 1997-98 academic year. As a result, five (5) required courses and one (1) elective course were offered in the Fall 1998 semester using the SUNY Learning Network (SLN) as its delivery system. Six additional courses were added in the Spring of 1999. This paper describes the process used and current progress towards delivering an AS degree in Engineering Science entirely over the Internet. The Engineering Science curriculum at BCC prepares students for transfer into junior level upper division courses at four year engineering schools across the country.*

In March of 1998, the Engineering Science Department at Broome Community College made a decision to deliver its entire two-year AS degree program in Asynchronous Learning (ASL). A three year implementation plan was developed that focused on delivery of "core engineering science courses" the first year. Additional engineering courses and social science classes would then be developed over the next two years.

The ES program at BCC was established in 1960 by Irwin Simser and its reputation for producing quality graduates is well known in New York State and across the country. The students at BCC have successful transfer records at institutions like RPI, Clarkson, RIT, SUNY Binghamton, Syracuse, VPI, Notre Dame, and others. A survey of these institutions indicated that 85 % of these students maintain or improve the GPA that they had achieved at BCC. The annual statewide TYESA design competition has seen BCC students place 1st or 2nd since its inception in 1990. Two years ago, BCC engineering students placed 2nd in both the Paper and Model ASEE National Engineering Design Competition for freshman. This past year, BCC placed 2nd in the ASEE TYCD Model competition.

Careful consideration had to be given to the issue of outcomes so that the competencies attained from traditional coursework would be equivalent to those developed in the ASL courses (teamwork, group work, and design). The SUNY Learning Network and the BCC Computer Center provided technical support for the delivery of the ASL courses, as well as having provided assistance in the development of the course templates and subject modules.

The engineering science core courses identified were University Physics I and II, Chemistry I and II, Calculus I and II, Statics, Dynamics, Circuits, Microprocessors, Strength of Materials, and Engineering Design II. Additional courses in Materials Science and Engineering Design III would be ready for Fall 1999. Each of these courses represented a significant challenge to offer in ASL mode. The courses are imbedded with specific notation that is not usually supported with a traditional word processors, have sophisticated three dimensional applications or computer programming codes, and represent "problem solving" versus discussion and paper-oriented coursework. In addition, the Physics and Microprocessor courses are "laboratory" courses, a component that has not usually been addressed with traditional ASL course formats. The chemistry department offers the lecture portion of its courses in ASL mode but still requires students to complete a traditional laboratory experience.

The entire curriculum was expected to be on-line during the 2000-2001 academic year. The design, development and delivery of this curriculum in ASL mode will be discussed. Although almost all of the courses have been developed on schedule, a few of the classes have never been delivered due to lack of any enrollment; Engineering Design II and III. Examples of different delivery techniques for laboratory experiences will be demonstrated. Present enrollment numbers are encouraging in the traditional core courses but the question of how to do an ASL Physical Education course still needs to be resolved.