

Clinical Engineering Education at the University of Connecticut

The clinical engineering graduate program at the University of Connecticut immerses the student in the practice of clinical engineering for two academic years. The program currently has 22 students split between first and second year students. Students complete seven graduate level engineering courses focused on topics in clinical engineering and work for 20 months as a clinical engineer in a university teaching hospital, large community hospital or a VA medical center in Southern New England.

A significant portion of the educational process takes place in the classroom where students dedicate six hours per week in the fall semester and three hours per week in the spring. Most classes are taught either on campus or in classrooms in nearby internship hospitals, with a few of the classes taught on-line in webinar format. The majority of learning however, takes place in the hospital's clinical engineering department as each student is assigned to work at one of the cooperating hospitals for the two year period. The student has a required work schedule and is treated as a department employee with accountability and assigned responsibilities. The student works as a staff clinical engineer under the guidance of the director of clinical engineering and other CE department staff at that hospital, becoming familiar with the healthcare environment and performing typical clinical engineering duties.

Typical duties given to these students include technology assessment research, product evaluations including human factors engineering analysis, project management of new technology installations, medical device networking and electronic medical record data integration, incident investigation using root cause analysis, risk management techniques such as failure modes and effects analysis, equipment planning for new construction, power quality analysis, wireless spectrum management and healthcare technology quality improvement.

"Internship meetings" are held twice per semester at one of the hospitals where the whole class meets for 4-5 hours to listen to various presentations. Typically these presentations are given by the interns about their hospital work, the CE department director on current CE issues, a clinical or technical expert from the hospital about a technology issue in their department and the UCONN CE Internship program director on issues related to non-academic subjects. These are followed by a tour of a technically interesting area of the hospital.

The program is geographically centered on the UCONN campus in Storrs, CT, with students located in hospitals from Boston, MA to New Haven, CT (140 miles apart). As a result the students need to travel by car to class and to internship meetings. As technology develops steps are being taken to increase the distance learning aspect of the program. Firstly to reduce the amount of commuting for the students, but secondly to perhaps expand the program and include hospital based internship locations outside of Southern New England.

Between classes and internship responsibilities, the students work the equivalent number of hours to a full time job. The hospitals appreciate the work of these young engineers and want to participate in the educational process, so they pay UCONN to place a student or two at their facility. The University in turn pays the student a graduate student assistantship and waives their tuition. The student graduates with a Master of Science degree in Biomedical Engineering, twenty months of clinical engineering experience, two years of academic coursework focusing on clinical engineering, a familiarity with the healthcare environment and exposure to 90% of the challenges clinical engineering departments face on a regular basis.

The vast majority of the graduates take jobs in clinical engineering departments in hospitals, but some are employed by independent service organizations, equipment planning firms, or medical equipment manufactures in clinical technology management, technology support, quality or design roles. There have been 115 graduates of the program in the past 15 years. More than 75% of the graduates each year receive multiple job offers before graduation with many companies reaching out to conduct on-campus interviews of the current graduating class.

The program also serves the international healthcare community by educating students from many countries. About 20 percent of the graduates have come from outside the US, including Argentina, Brazil, Chile, Colombia, Dominican Republic, El Salvador, Mexico, Albania, Angola, India, Italy, Lebanon, Malaysia, Macau, Pakistan, and Saudi Arabia. The majority of these students return home and provide a positive impact on the healthcare system in their home countries.