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Educational Activities At The Nuclear Engineering Teaching Laboratory

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Abstract. The Nuclear Engineering Teaching Laboratory (NETL) at the University of Texas at Austin performs a wide variety of educational activities for students at various levels. Regular on-site courses in the areas of health physics, radiochemistry, and reactor operations are offered for university credit. Along with on-site courses, access to the reactor facility via a remote console connection allows students in an off-site classroom to conduct experiments via a “virtual” control console. In addition to the regularly scheduled courses, other programs, such as the Nuclear Regulatory Commission Summer Nuclear Engineering Institute and Office of Naval Research partnerships with Historically Black Colleges and Universities, provide access to the facility for students from other universities both domestic and foreign. And NETL hosts professional development programs such as training programs for Nuclear Regulatory Commission personnel and International Atomic Energy Agency fellowships.

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INTRODUCTION

The Nuclear Engineering Teaching Laboratory (NETL) at The University of Texas at Austin (UT-Austin) would appear to be a typical university research facility. This facility houses a TRIGA Mark II research reactor with associated experimental beamlines, a 14 MeV neutron generator, laboratory space, classroom space, office space, and conference room. The facility has a very strong research program as well as providing service (primarily in the form of nuclear analytical services) to a variety of internal and external customers. However, as the name implies, a large part of the function of the facility is education. From the NETL mission statement, the primary mission is to “educate the next generation of leaders in nuclear science and engineering.” Education at NETL is performed via a variety of methods.

Through the Nuclear and Radiation Engineering Program, an undergraduate nuclear certificate is offered and graduate degrees are offered within the Mechanical Engineering Department. Of the courses required for these degrees, approximately a dozen courses (see Table 1.) utilize the NETL facilities.

Some of the courses require direct access to the facility for hands-on education in reactor physics and nuclear science. As the NETL is located on the J.J. Pickle Research Campus (approximately ten miles north of the main academic campus of The University of Texas at Austin), it is convenient to have remote access to the facility for some activities. Thus, some classes access the facility via a “virtual console” which allows students to observe reactor parameters and participate in experiments from remote locations such as the main academic campus.

Not wanting to limit the teaching mission to just students at UT-Austin, NETL hosts the Summer Nuclear Engineering Institute to further the education mission. This one-month institute is primarily for sophomores and juniors majoring in technical fields outside of nuclear engineering and typically from universities other than UT-Austin. Students study fundamental health physics and nuclear engineering concepts, and gain hands-on experience at the reactor and other experimental facilities with credit hours available to the students via the Division of Continuing Education. Additionally, NETL partners with Historically Black Colleges and Universities to allow access to students from participating institutions.

TABLE 1. Nuclear and Radiation Engineering Program courses utilizing the Nuclear Engineering Teaching Laboratory.

Course Number	Course Name
ME 136N	Concepts in Nuclear and Radiological Engineering
ME 337C	Introduction to Nuclear Power Systems
ME337F	Nuclear Environmental Protection
ME 361E	Nuclear Operations and Reactor Engineering
ME 361F	Radiation and Radiation protection Laboratory
ME 388C	Nuclear Power Engineering
ME 388N	Design of Nuclear Systems I
ME 389C	Nuclear Environmental Protection
ME 390F	Nuclear Analysis Techniques
ME 390G	Nuclear Engineering Laboratory
ME390T	Nuclear- and Radiochemistry

Professional development is another component of the education mission at NETL with various seminars and short courses offered to nuclear professionals. One such offering is a special training program for U.S. Nuclear Regulatory Commission personnel without prior reactor experience to give them hands-on understanding of areas that they may be regulating. Through its strong relationship with the International Atomic Energy Agency (IAEA), NETL conducts training for IAEA Fellows and visiting scientist in the form of on-site, on-the-job training in subjects such as reactor operations, radiochemistry, health physics, and related topics. At times NETL personnel travel to other IAEA institutions to provide training as well. Additionally, NETL offers a training program for individuals to become licensed by the NRC as reactor operators. And NETL has a number of part-time undergraduate research assistant positions where students receive on-the-job training in various laboratory techniques.

Although not a traditional classroom activity, public education is also included in the education mission of the NETL. NETL personnel routinely conduct such activities as seminars for special interest groups (such as Boy Scouts earning the Nuclear Science Merit Badge), tours for public school classes, and specialized training for emergency responders. These activities help educate the public in relevant topics in nuclear science to increase their awareness of nuclear science issues relating to everyday life.

Along with its ability to conduct leading edge research, the Nuclear Engineering Teaching Laboratory is truly an educational facility.

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