

Program Educational Objectives November 2008 (Reviewed/Revised May 2013)

The current Program Educational Objectives (PEOs) for the NE and RHP programs have been approved by the faculty and our Industry Advisory Board. The PEOs are focused on the qualities we expect our graduates to demonstrate in their post-baccalaureate careers. To instill these characteristics in our graduates, a comprehensive educational experience is required. The details of our undergraduate curriculum are documented on our departmental website ne.oregonstate.edu.

Depth. In their jobs and/or graduate studies, graduates will identify, formulate, analyze and solve nuclear engineering problems by applying fundamental and advanced mathematical, scientific, and technical knowledge and skills. Graduates will engage in lifelong learning and professional development, as demonstrated by participation in technical seminars, professional conferences and symposiums, and discipline specific trainings. Depth is an attribute that will enable our graduates to advance technically, as evidenced by promotions/raises, the earning of advanced degrees, professional visibility (publications, presentations, patents, inventions, awards) and entrepreneurial activities.

Depth is addressed throughout the curriculum. It begins with the foundation in the freshmen year of mathematics, physics, and RHP orientation, and culminates with rigorous discipline-specific courses and engineering design in the senior year. Our curriculum emphasizes the use of modern scientific techniques, skills and tools (hardware and software) allowing our graduates to seamlessly transition into graduate school or applied science employment.

Breadth. Graduates will employ their broad understanding of complex systems and individual components in their technical practice. Breadth also includes a continuing awareness and understanding of current issues, influences, and trends needed to understand the impact of NE solutions in global and societal contexts. Graduates demonstrate breadth by developing and utilizing capabilities outside their primary technical areas of expertise. Breadth is also addressed throughout the entire curriculum. It is promoted through the non-NE courses that students take in their undergraduate program including required physical sciences, mathematics, restricted electives, and baccalaureate core courses. Students are encouraged to participate, and assisted in arranging, internship or summer research experiences where they interact in a multidisciplinary working environment.

Professionalism. To be successful in modern work environments, graduates must employ responsible teamwork, clear communication skills, effective project management capabilities, professional attitudes, and a clear understanding of the ethical issues faced by our profession. Graduates demonstrate professionalism through technical presentations, membership and leadership positions in professional societies, and management or training responsibilities. These skills are developed in the freshman orientation courses, and in many courses throughout the curriculum. Senior design (NE 475), in particular, emphasizes communication and teamwork skills, as well as project management and ethics. Senior nuclear engineering

students also participate in the College of Engineering's Engineering Expo in the spring, where they present their projects to members of the community, faculty, student peers, and representatives of industry.

Problem Solving. In their jobs and/or advanced degree programs, graduates will integrate their knowledge and skills to solve real-world problems. They will use technical insight and judgment to design, construct and analyze safe, reliable and economical nuclear components and systems. Patents, technical publications, and design awards are typical evidence of effective problem solving skills. Formal laboratories in PH 211/212/213 and NE 115/236/415/475 provide the students with experience applying their theoretical knowledge to practical problems.

Community. Graduates will exist within a professional and educational community, must provide for their own professional growth and development and have a responsibility to contribute to the growth and development of their colleagues. Involvement in professional societies, participation in mentoring activities, public service and continued education and training are ways in which graduates can demonstrate their commitment to their community. Students will have interacted with other students at the pre-college, undergraduate, and graduate levels, and with faculty, practicing nuclear engineers, and other professionals, providing avenues for building skills in mentoring, communication, and networking, as well as appreciation for diverse perspectives. Students are encouraged to participate in the activities of the student chapters of the American Nuclear Society (ANS), Health Physics Society (HPS), Society of Women Engineers, and any other professional organizations that suit their interests and qualifications. Over the past five years, our students have become very active in student chapters of ANS and HPS, hosting the national ANS student conference for only the second time in our history in 2007. Many nuclear engineering students and faculty participate in the ANS Annual Meeting. NE students also routinely participate in community outreach and educational programs such as tours of the Radiation Center for members of the community during Mom's and Dad's Weekends and Beaver Open House and hosting interactive displays and activities for OSU's Discovery Days (a several day event that promotes science programs to elementary school students).

Innovation. Graduates will apply their technical abilities and engage in innovative activities, creating new products, processes and knowledge. Innovation is demonstrated by patents, design awards, promotion to technical leadership positions, and recognition by peers in professional societies. Laboratories throughout the curriculum promote the excitement of discovery and exercise creativity. Students see first-hand how the technical concepts come to life in many of their NE laboratories. This has been further enhanced by incorporating design and laboratory components into the introductory freshman sequence of courses.