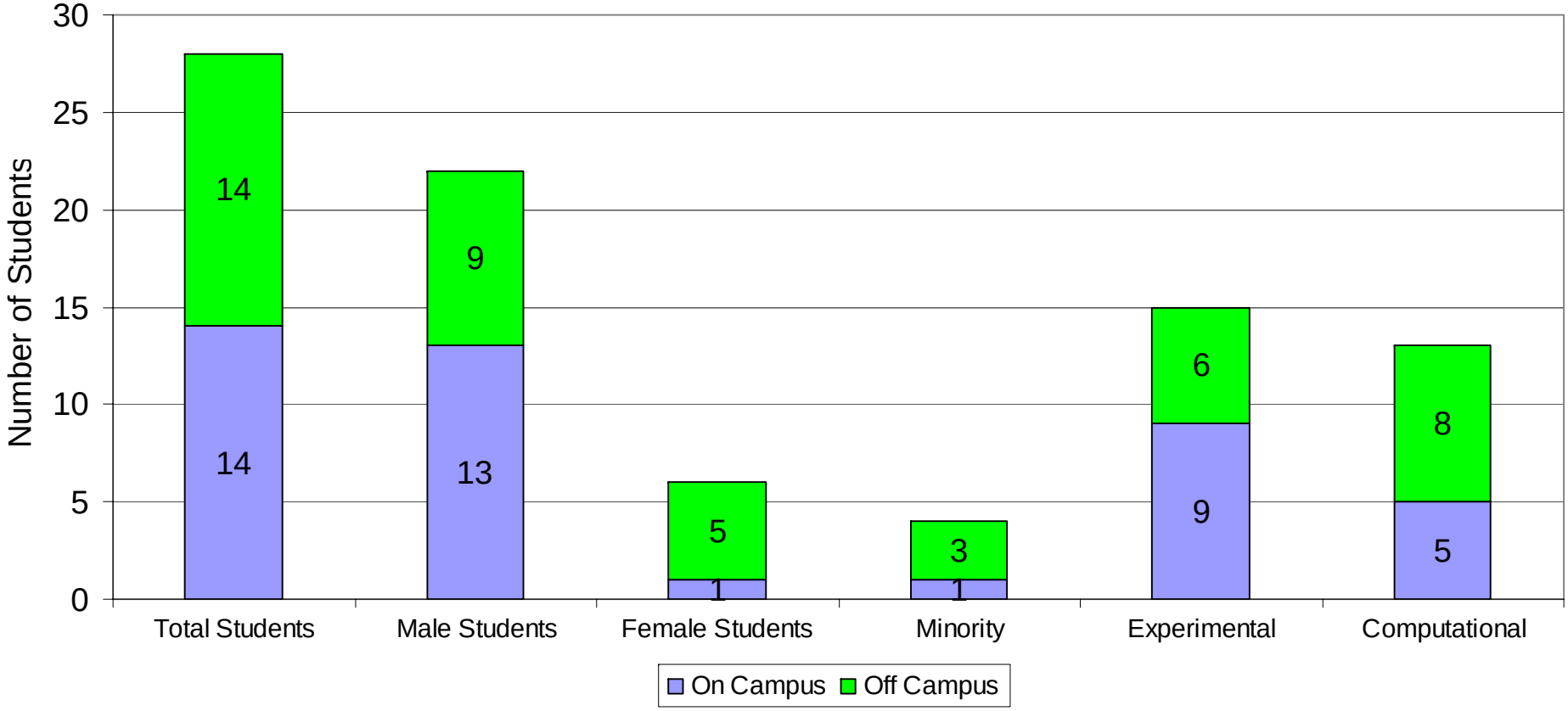
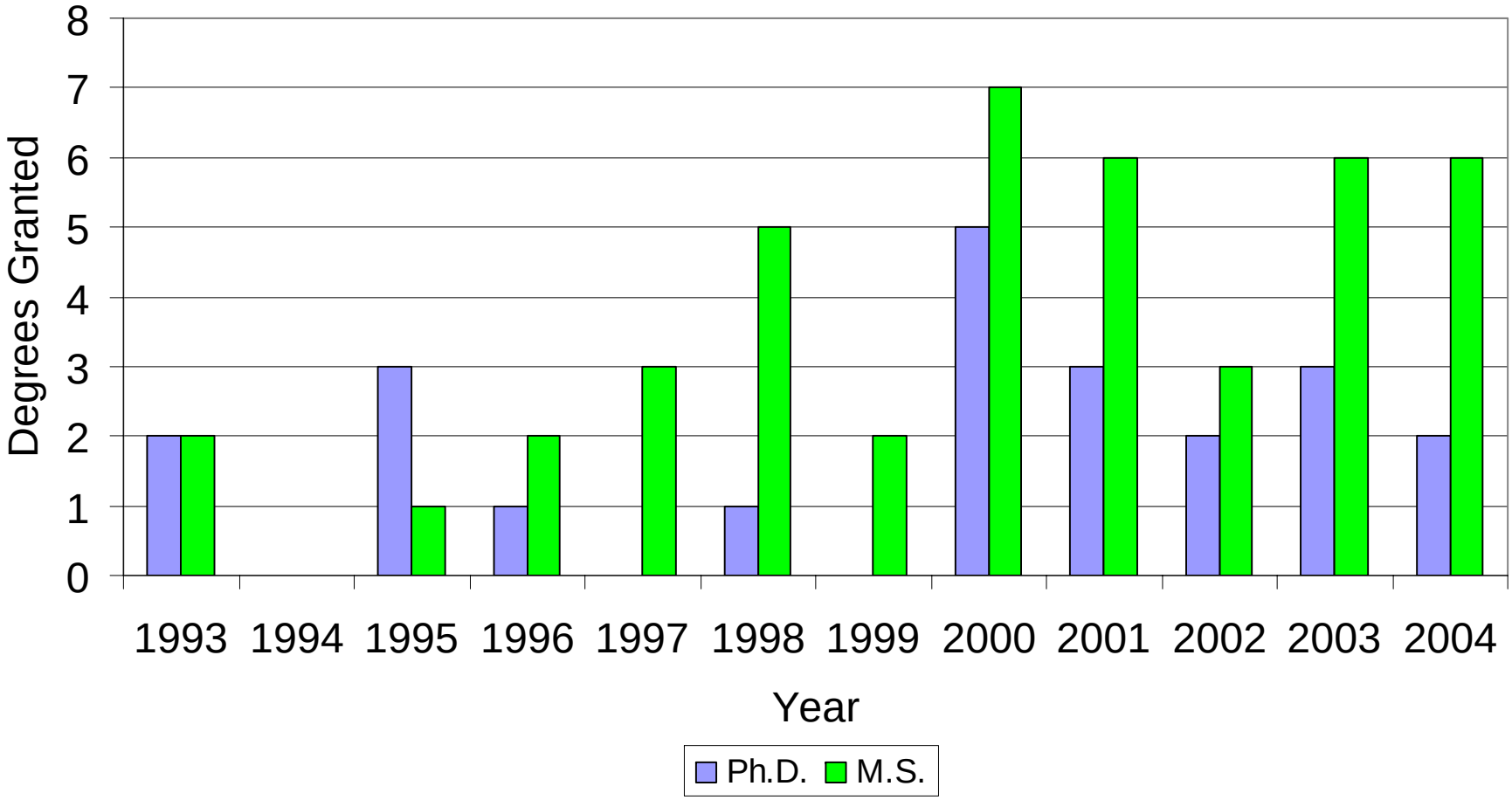
Nuclear Student Profile at The University of Texas at Austin



Nuclear Program Degrees Granted at The University of Texas at Austin



Graduate Education in Nuclear and Radiochemistry

Web-Based Course in Nuclear and Radiochemistry

- Radioactivity in Nature
- Radioelements, Isotopes and Radionuclides
- Physical Properties of Atomic Nuclei and Elementary Particles
- Radioactive Decay
- Decay Modes
- Nuclear Reactions
- Nuclear Energy, Nuclear Reactors, Nuclear Fuel and Fuel Cycles
- Radioanalysis

Laboratories

- Radioactive Work Permit Lab – Working with radioactive material. This students learn how to safely work with radioactive material and the regulations/laws pertaining to working with radioactive material.
- Neutron Activation Analysis: In this lab the students learn the basic concepts of neutron activation analysis and identify unknown samples.
- Fission Product Identification. In this lab, the students learn how to make efficiency curves, energy calibrations, and activity calculations for gamma counting.
- Alpha Counting. The students learn basic concepts of alpha counting and sample preparation.

Laboratories Cont'd

- Liquid Scintillation. The students learn basic of concepts scintillation counting for beta measurements and sample preparation.
- Statistics. Basic concepts in low counting statistics with radioactive solutions of various strengths and a sodium iodide detector.
- Leaching Dynamics & Adsorption of Radioactive Species. The students learn basic environmental characteristics of radioactive material in soil samples.

National Lab Research Funded Projects

- Surface complexation models for predicting radionuclide sorption to oxide minerals.
- Development of an electronically switchable ion exchange system in which a biopolymer is attached to a support material such as carbon. The biopolymer ligand is designed to selectively adsorb specific metal ions or radionuclides and to be sensitive to oxidation/reduction conditions.
- Evaluation of a combined zero valent iron/biodegradation for radionuclides.

National Lab Research Funded Projects Cont'd

- Fluid dynamics modeling of the ANL Centrifugal Contactor.
- Radiochemistry research for uranium remediation studies.
- Optimization of rapid analysis of fused debris to identify and calculate isotopic ratios of ^{239}Pu, ^{237}Np, ^{241}Am, ^{244}Cm, and various U isotopes
- Exploration of radiological and mechanical properties of leaded gloves for use in plutonium manipulations at Technical Area (TA)-55.
- Characterization of efficiency curves for germanium detectors using MCNP.

National Lab Research Funded Projects Cont'd

- Brain mapping of ^{40}K and correlating the total potassium in multiple sclerosis patients.
- Use of prompt gamma neutron activation analysis to verify Monte Carlo codes for the determination of photon abundances of specific materials.
- Development a computer controlled servo motor that raises and lowers the lead wires to improve the repeatability of the electroplating process for actinide analysis.
- In-situ neutron scattering methods to determine carbon in soil.

National Lab Research Funded Projects Cont'd

- Prompt gamma activation analysis for hydrogen analysis in lithium batteries
- Usage of the ORIGEN code to identify unusually low abundant fission products to be then experimentally identified using the LLNL accelerator mass spectrometry.
- Nuclear Fuel Simulator. This research is to further refine a model to ascertain the total radioactive waste inventory of all United States nuclear power plants.