UNIVERSITY OF IDAHO
Graduate Program – Nuclear Engineering
Quick Overview

Vivek Utgikar, Presenter
Akira Tokuhiro, Director
Alice Allen, Program Coordinator
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UI Nuclear Engineering Graduate Program

- Interdisciplinary graduate program under Mechanical Engineering Department, degrees:
  - M.Engr, NE (non-thesis)
  - M.S., NE (thesis)
  - Ph.D., NE (thesis)
- Focus areas: nuclear materials, reactor engineering-thermohydraulics-safety, radioactive waste treatment, modeling/simulations and computing
- Co-located with ISU NSE program, BSU MSE program
UI Nuclear Engineering Graduate Program

• Specialty Tracks
  – Thermohydraulics
    • Heat transport and advanced power generation
  – Nuclear Materials
    • Advanced Materials and radiation effects
  – Fuel Reprocessing
    • Back end of the fuel cycle
  – Thermal Fluids
    • Fluid dynamics and advanced heat transfer
  – Nuclear Criticality Safety
    • Operational safeguards
UI Nuclear Engineering Graduate Program

FACULTY, COURSES, STUDENTS

Idaho Falls: Tokuhiro (NE), Aydogan (NE), Phongikaroon (ChE), Gunnerson (ME, retired), McBurney-Rebol (NE, instructor); contributing faculty: Hiromoto (CS), Manic (CS), McEligot (ME, retired); Ostrom (INDT), Kanakala (INDT)

Moscow: Utgikar (ChE), Charit (MSE); contributing faculty: Pesic (MSE), Bitterwolf (CHEM), Wai (CHEM), Machleidt (PHYS), Sammarruca (PHYS)

Courses in fuel reprocessing, special applications (hydrogen), reactor engineering and thermohydraulics, industrial safety (nuclear technology and practice)

20+ traditional, full-time graduate students
40+ non-traditional, part-time graduate students
**Required and ‘popular’ courses**

- **ME540** – *Continuum Mechanics* (usually offered during Spring semester from Moscow campus)
- **ME541** – *Mechanical Engineering Analysis* (usually offered both Fall and Spring (via DVD) semesters from Moscow); Chemical Engineering Analysis
- **NE450** – *Principles of Nuclear Engineering*
- **NE 565** – *Reactor Engineering* (aka: Intermediate NE)
- **NE575** – *Advanced Nuclear Power Engineering*
- **NE537** – *Radiation Effects on Materials*
- **NE538** – *Introduction to Nuclear Materials*
- **NE 535/555** – *Nuclear Criticality Safety I & II*
- **NE554** – *Radiation Detection and Measurement*
- **NE504A** – *Nuclear Heat Transport; Molten Salt Technology*
- **NE504B** – Advanced *Nuclear Systems and Modeling*
Center for Advanced Energy Studies

A research partnership between Boise State University, Idaho National Laboratory, Idaho State University and University of Idaho
• **Center for Advanced Energy Studies**
  • 55,000ft² (about 40% lab space)

• **User Labs**
  • Imaging Suite
  • Material Science Lab
  • Thermal-Fluids Lab
  • Virtual Reality CAVE
  • Radiochemistry Lab
  • Analytical Chemistry
  • Machine shop, instrumentation rooms
  • Wind and PV-solar demonstrations

• **Representative Success**
  – Overall tremendous ratio of ROI; now funded yearly
  – Consistently garnered nationally-competitive nuclear R&D funding since 2009
  – Most recently awarded some $2.5M in awards; 3 faculty
  – One grad student awarded $155K fellowship for PhD
  – Number of international graduate students from one in 2007 to 20+ today (Korean interns under Korea WEST)
Recent Highlights

• Ammon Williams, Rob Hoover – ANS student conference awards
• Rob Hoover – Innovations in Fuel Cycle Research award
• Ryan Davis, Olu’ Omotowa - DOE National Labs’ Modeling, Experiments and Validation Summer School
• Lei Tu - recipient of $5K Post Foundation graduate fellowship
• Leslie Kerby - summer internship at LANL; fully supported through MS & PhD by LANL
• Clemente Parga – recipient of 3½ year European Union PhD Fellowship; thesis work at French ‘Atomic Energy’ Laboratory in Cadarache, France
• Olumuyiwa Omotowa - attended World Nuclear University Summer Institute at Oxford University (only student), 2010; presented at IAEA (Vienna) and World Institute for Nuclear Security (Abuja, Nigeria) in 2012
• Richard Skifton - recipient of DOE NEUP Graduate(PhD) Fellowship worth $155K; first UI student ever to receive this
• 11th Korea West intern from Cultural Vistas-Korea West arrived in Idaho Falls, (U.S.-Korea exchange program)
Key to future of nuclear engineering in Idaho

Construction of ‘CAES-II’
- Integration of STEM in nuclear energy-
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