

# Department of Nuclear Engineering

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Nuclear engineering is concerned with the engineering aspects of the control, release, and utilization of nuclear energy from both fission and fusion nuclear reactors. Nuclear reactors serve many functions: they serve as heat sources for electric power plants and are used in the production of radioactive isotopes for a variety of peaceful applications. Nuclear methods are applied in medical diagnosis and treatment, scientific research, and the search for new resources. The nuclear engineering program educates individuals in scientific and engineering principles essential for effective and productive contributions in industrial, university and government service. The Department of Nuclear Engineering has a national graduate ranking of #3 among all nuclear engineering programs. The undergraduate program continues to be highly respected by the nuclear industry.

## Scholarships and Awards

Several special scholarships exist for NC State nuclear engineering students, including the Duke Energy, Institute for Nuclear Power Operations, American Nuclear Society, U.S. Department of Energy and the U.S. Nuclear Regulatory Commission scholarships. A special department fund supports scholarships for exceptional upperclassmen. NC State nuclear engineering students have received special recognition awards at the Undergraduate Research Symposium and have gained national recognition by several times receiving the Student Design Award of the American Nuclear Society. NC State nuclear engineering students are also frequent recipients of nationally awarded fellowships.

## Facilities

Facilities for nuclear education include a nuclear research reactor (PULSTAR), which can be operated at a steady state power of 1 MW; radiation detection laboratories; nuclear materials laboratory; thermal hydraulic laboratory; prompt gamma facility; neutron activation analysis laboratory; radio-chemistry laboratories; nuclear simulation laboratory; neutron radiography unit; positron facility; ultra cold neutron source; neutron diffractometer; numerous computer facilities including, departmental computer workstations, College of Engineering EOS engineering workstations, microcomputers; reactor simulation laboratory; plasma generation and diagnostics laboratory, atmospheric plasma science laboratory, and plasma launchers laboratory.

## Mission

The Department of Nuclear Engineering has four primary missions:

1. Provide a quality education at both the undergraduate and graduate levels to students who desire to pursue careers in nuclear science and engineering.
2. Develop research programs in areas of emphasis related to applications of nuclear science and engineering.
3. Assist industries and government in North Carolina, nationally and internationally in their efforts to apply these nuclear technologies to the betterment of the economy and the environment - in a safe, effective, and innovative manner.
4. Enhance, promote, and utilize the PULSTAR research reactor and associated facilities in an exemplary manner, leading to national

recognition as a premier 1 MW Nuclear Reactor Program dedicated to research, teaching, and extension.

## Program Educational Objectives

Consistent with the Department of Nuclear Engineering's mission, the department has developed the following objectives for undergraduate education.

The Nuclear Engineering program is preparing its graduates for:

1. A track record of solving technical challenges facing the field of nuclear engineering through the detailed process of engineering design and the advance of nuclear engineering practice and research;
2. A reputation of adhering to the highest professional standards in the field, holding both the societal and environmental impact of their field's practices in the highest regard;
3. Written and oral communication skills that are highly effective in a diverse, cross-disciplinary, and global community of colleagues and stakeholders; and
4. The professional responsibility of continued self-improvement and education through professional licensing, graduate and professional education, and continued lifelong learning.

## Contact

Burlington Engineering Laboratories  
Room 3140  
919.515.2301  
Nuclear Engineering website (<http://www.ne.ncsu.edu>)

## Faculty

### Head

K.N. Ivanov, *Department Head, Professor*

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## Director of Undergraduate Program

J.M. Doster, *Director of Undergraduate Program, Alumni Distinguished Undergraduate Professor, Director of CASL Education Program*

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## Director of Graduate Programs

S.C. Shannon, *Director of Graduate Program, Professor*

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## Director of Outreach, Retention & Engagement - Lecturer - Adviser

L.M. Marshall, *Director of Outreach, Retention & Engagement, Lecturer, Adviser, Educational Director of CNEC*

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## Assistant Director, Graduate Student Activities

M. Milev, *Assistant Director of Graduate Support Activities*

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## Professors

Y.Y. Azmy, *Distinguished Professor of Nuclear Engineering, Director of CNEC*

M.A. Bourham, *Alumni Distinguished Graduate Professor, Director for College of Engineering Master of Engineering Program*

N. Dinh, *Professor, Joint Appointment with ORNL*

J.G. Gilligan, *Distinguished University Professor, Executive Associate Dean, Director of NEUP Integration Office for the U.S. Department of Energy*

K.L. Murty, *Progress Energy Distinguished Professor*

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## Professor and Director of Nuclear Reactor Programs

A.I. Hawari, *Distinguished University Professor, Director of Nuclear Reactor Program*

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## Research professors

S.P. Palmtag, *Research Professor, CASL Chief Technologist*

B.W. Wehring, *Research Professor*

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## Professor emeriti

D.J. Dudziak, *Professor Emeritus*

R. Gardner, *Alumni Distinguished Graduate Professor*

P.J. Turinsky, *Professor Emeritus*

K. Verghese, *Professor Emeritus*

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## Adjunct professors

S.M. Bragg-Sitton, *Adjunct Professor*

J.A. Favorite, *Adjunct Professor*

D. Kropaczek, *Adjunct Professor*

R.R. Pamper, *Adjunct Professor*

C.L. Smith, *Adjunct Professor*

G. Tryggvason, *Adjunct Professor*

R.W. Youngblood III, *Adjunct Professor*

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## Associate professors

D.Y. Anistratov, *Associate Professor*

A.N. Avramova, *Associate Professor, Director of Reactor Dynamics & Fuel Modeling Group, Coordinator of CTF Users' Group, Director of Consortium for Nuclear Power*

I.A. Bolotnov, *Associate Professor, Joint Appointment with ORNL*

J. Eapen, *Associate Professor*

R.B. Hayes, *Associate Professor, Joint Appointment with ORNL*

D. Kaoumi, *Associate Professor*

J. Mattingly, *Associate Professor, University Faculty Scholar, CNEC PI & Chief Scientist*

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## Teaching associate professor

E. Loewen, *Teaching Associate Professor*

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## Adjunct associate professors

D. Archer, *Adjunct Associate Professor*

E.M. Brubaker, *Adjunct Associate Professor*

W.K. Cope, *Adjunct Associate Professor*

D.L. Green, *Adjunct Associate Professor*

P.A. Hausladen, *Adjunct Associate Professor*

V.J. Jodoin, *Adjunct Associate Professor*

P.A. Kraus, *Adjunct Associate Professor*

V.N. Kucukbogaci, *Adjunct Associate Professor*

J.W. Lane, *Adjunct Associate Professor*

E.H. Martin, *Adjunct Associate Professor*

W.D. Pointer, *Adjunct Associate Professor*

A. Ranjan, *Adjunct Associate Professor*

M.F. Simpson, *Adjunct Associate Professor*

M.L. Zerkle, *Adjunct Associate Professor*

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## Assistant professors

M. Diaconeasa, *Assistant Professor*

J. Hou, *Assistant Professor*

K. Stapelmann, *Assistant Professor*

X. Wu, *Assistant Professor*

G. Yang, *Assistant Professor*

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## Adjunct assistant professors

J. Dahl, *Adjunct Assistant Professor*

J. Li, *Adjunct Assistant Professor*

N. Kumar, *Adjunct Assistant Professor*

R.C. Sit, *Adjunct Assistant Professor*

L.G. Worrall, *Adjunct Assistant Professor*

R.J. Zerr, *Adjunct Assistant Professor*

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## Health Physicist - Lecturer

G.D. Wicks, *Reactor Health Physicist, Lecturer*

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## Nuclear Services Manager - Lecturer

S. Lassell, *Manager of Nuclear Services, Lecturer*

## Plans

- Health Physics (Minor) (<http://catalog.ncsu.edu/undergraduate/engineering/nuclear/health-physics-minor/>)
- Nuclear Engineering (BS) (<http://catalog.ncsu.edu/undergraduate/engineering/nuclear/nuclear-engineering-bs/>)
- Nuclear Engineering (Minor) (<http://catalog.ncsu.edu/undergraduate/engineering/nuclear/nuclear-engineering-minor/>)