

Finding Personnel for the Nuclear Industry

- the role of educational
institutions

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Overview

- Some Key Demand Drivers
- Employee Trends: current & projected
- Educational Pipeline
- NC State's Nuclear Engineering Initiatives:
 - strategic enrolment management; partnerships
- Questions/Comments

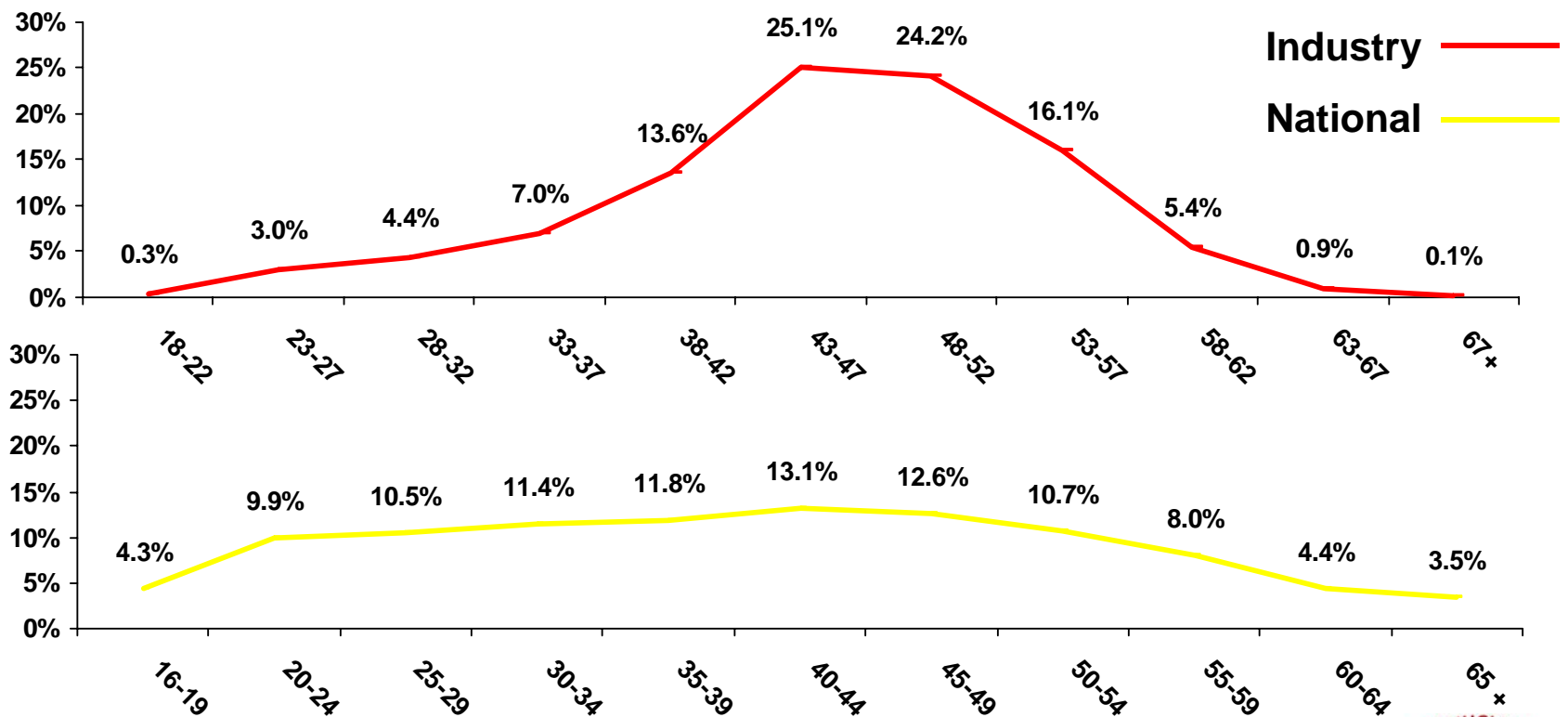


Demand Drivers For Personnel

- License renewals
- New plant designs from Toshiba, Westinghouse, AREVA, GE
 - ABWR, ESBWR, AP1000, EPR
- DOE power initiatives
 - GNEP, Gen IV
- Homeland security
- Attrition figures



Nuclear Industry Workforce v.s. National Workforce



Source: Bottom Graph - Bureau of Labor and Statistics, 2004 Employed Civilian Labor Force; Top Graph - NEI Workforce Survey, 2005

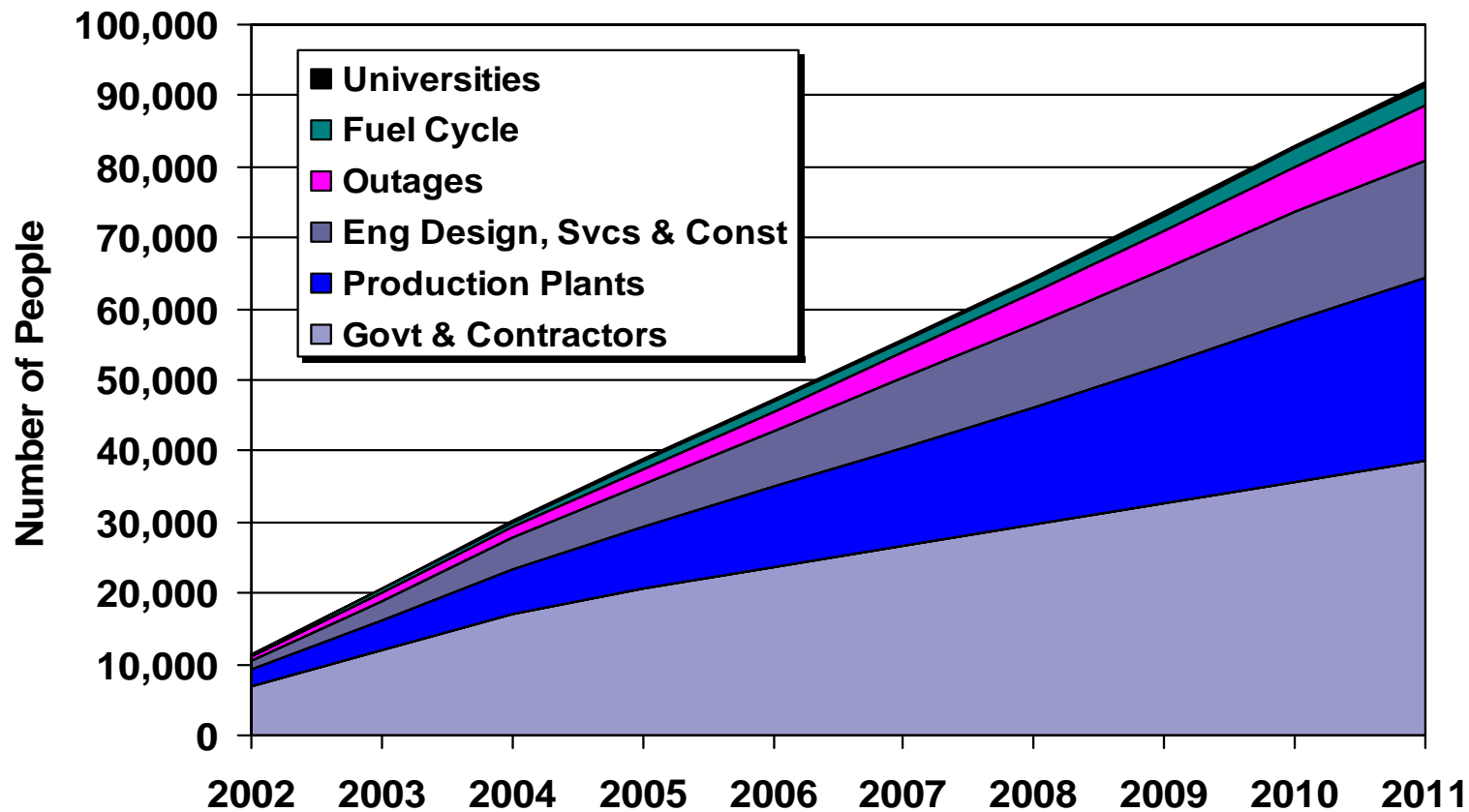


Projected Employee Status

- Median age of US labor force is projected to rise to 41.4 in 2012 (36.6 in 1992)
- Nuclear power generators may expect 40% attrition in next 5 years (23,200)
 - 15,600 look to retire
 - 7,600 will be lost through general attrition
- Key suppliers anticipate 32% of their workers will be eligible to retire by 2009
 - 13% through general attrition
- Demand Drivers → Critical Staffing Concerns

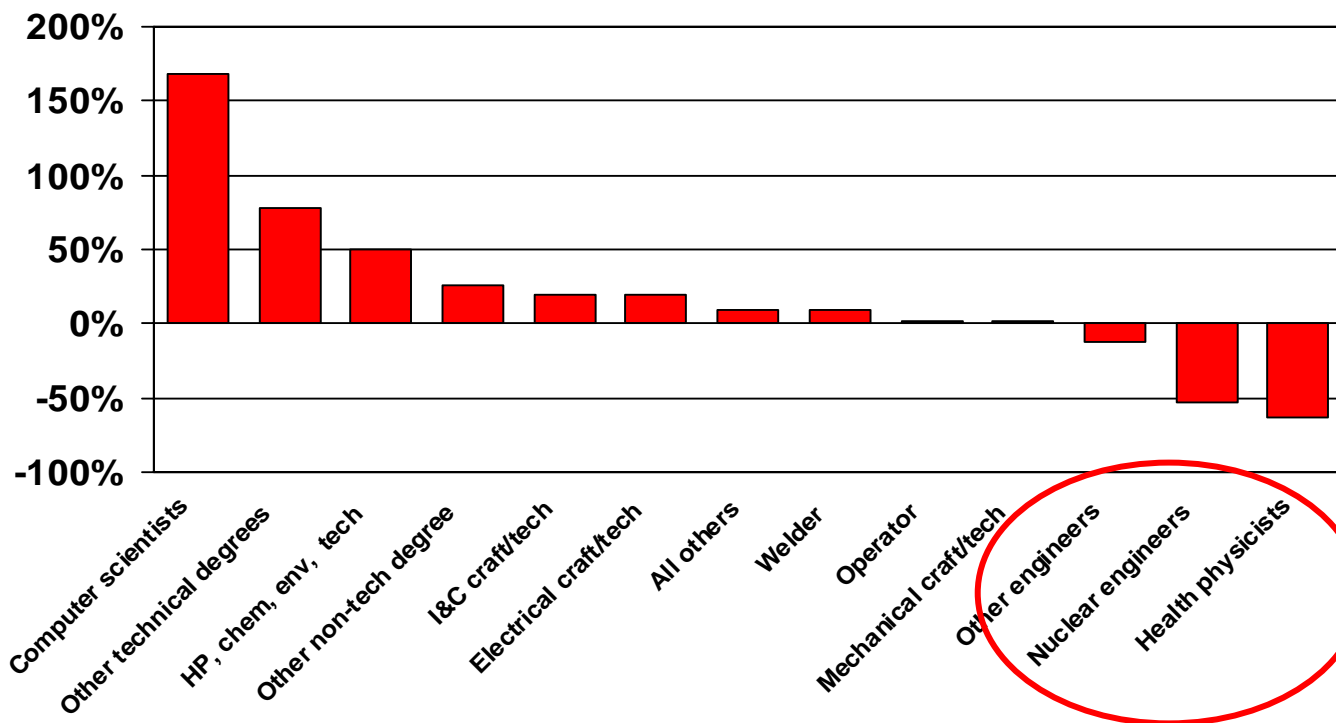


Cumulative Demand for New Employees



Worker Supply Projected To Decrease In Key Areas

% Change In New Worker Supply (2002 - 2011)



Health Physics Professionals

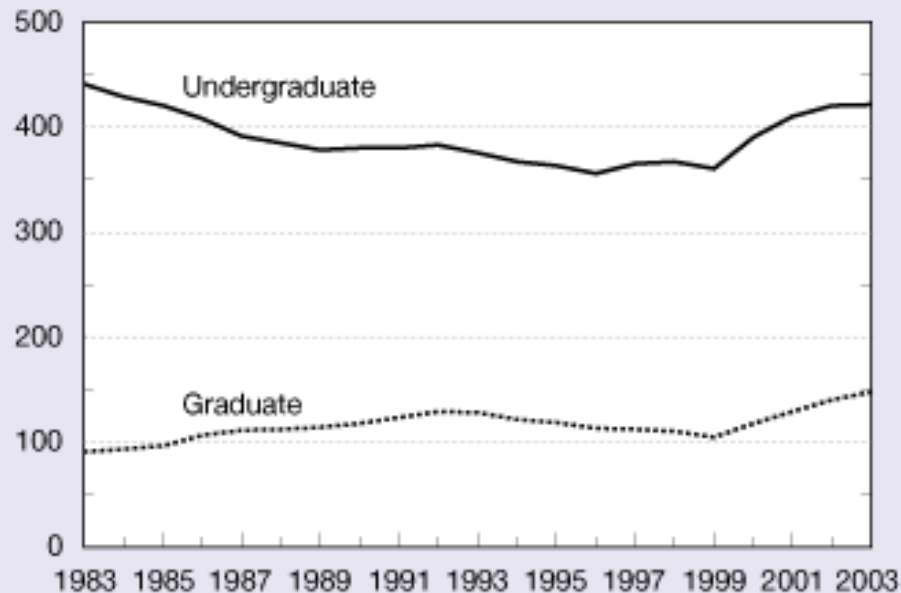
- Shortage of qualified radiation protection professionals
- Present demand is approximately 130% of supply
- Over next 5 years demand will outstrip supply by 160%
- In 10 years, demand will more than double the supply



Educational Supply

Figure 2-4
U.S. engineering enrollment, by level: 1983–2003

Students (thousands)



NOTE: Enrollment data include full- and part-time students.

SOURCE: Engineering Workforce Commission, *Engineering & Technology Enrollments, Fall 2003*, American Association of Engineering Societies (2004).

Science and Engineering Indicators 2006

New engineers
1985 = 85,000
mid-90s = 65,000
2004 = 75,000 approx.

Reasons students cite for leaving engineering:
curriculum and pedagogy

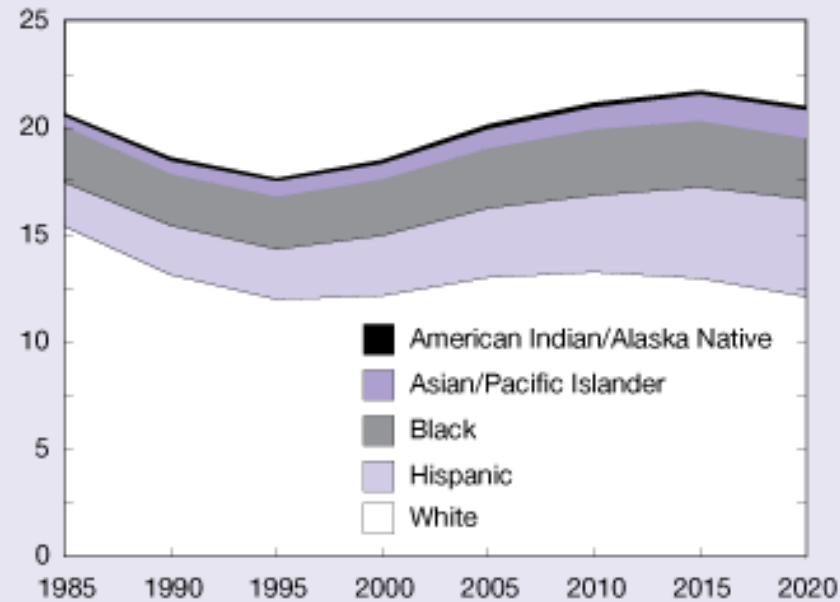
(W. Wulf, President, National Academy of Engineering, 2004)



Demographics Trends

Figure 2-2
**U.S. population ages 20–24 years, by race/
ethnicity: Selected years, 1985–2020**

Population (millions)



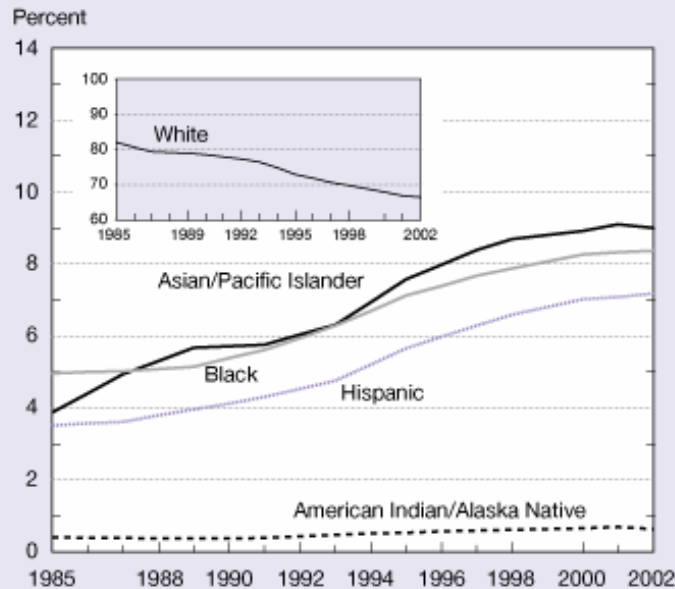
SOURCE: U.S. Census Bureau, Population Division, 1990 Census; and Population Projection Program, *Projections of the Resident Population by Age, Sex, Race, and Hispanic Origin: 1999 to 2100*. See appendix table 2-4.

Science and Engineering Indicators 2006



Educational Supply

Figure 2-12
Minority share of S&E bachelor's degrees, by race/ethnicity: 1985-2002

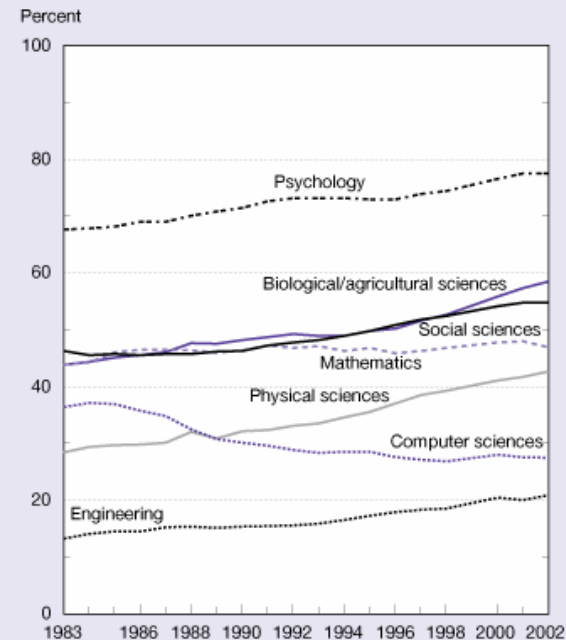


NOTE: Data not available for 1999.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey; and National Science Foundation, Division of Science Resources Statistics, WebCASPAR database, <http://webcaspar.nsf.gov>. See appendix table 2-27.

Science and Engineering Indicators 2006

Figure 2-11
Female share of S&E bachelor's degrees, by field: 1983-2002



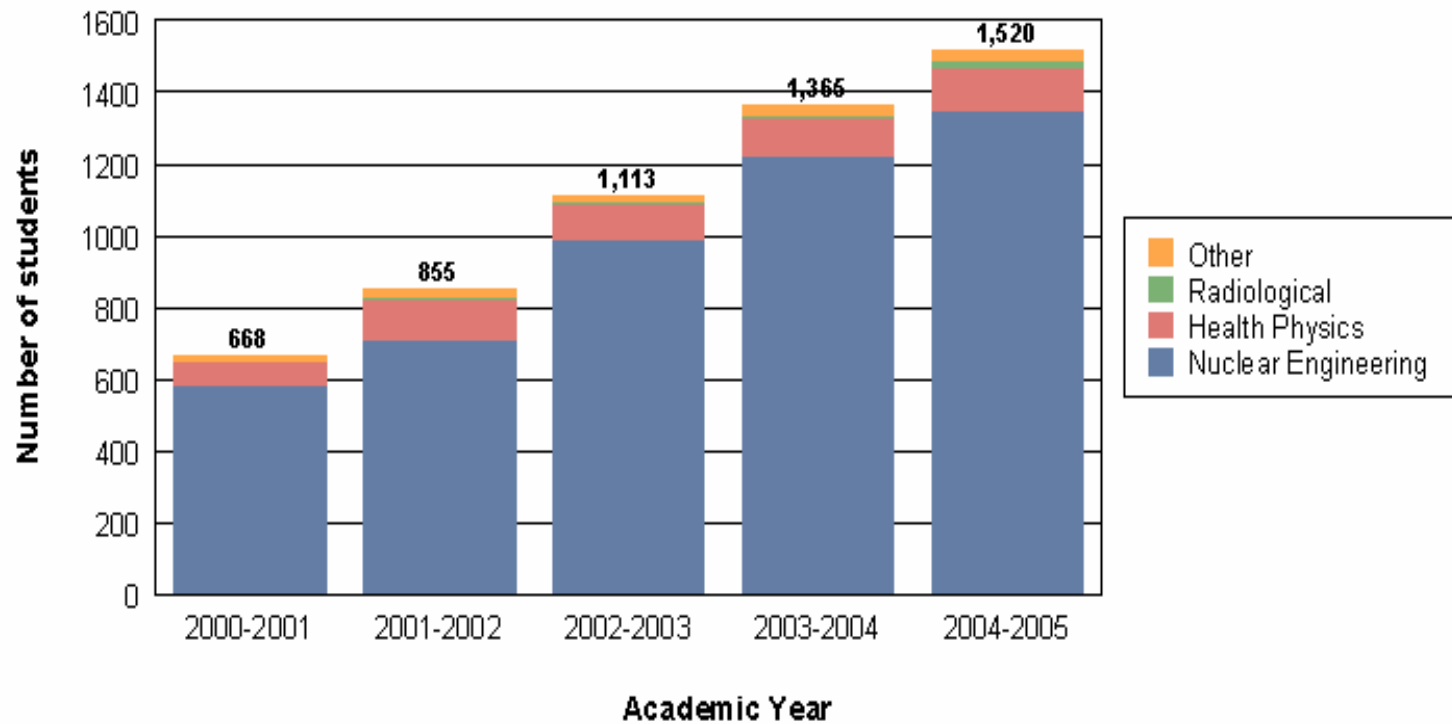
NOTES: Physical sciences include earth, atmospheric, and ocean sciences. Data not available for 1999.

SOURCES: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey; and National Science Foundation, Division of Science Resources Statistics, WebCASPAR database, <http://webcaspar.nsf.gov>. See appendix table 2-26.

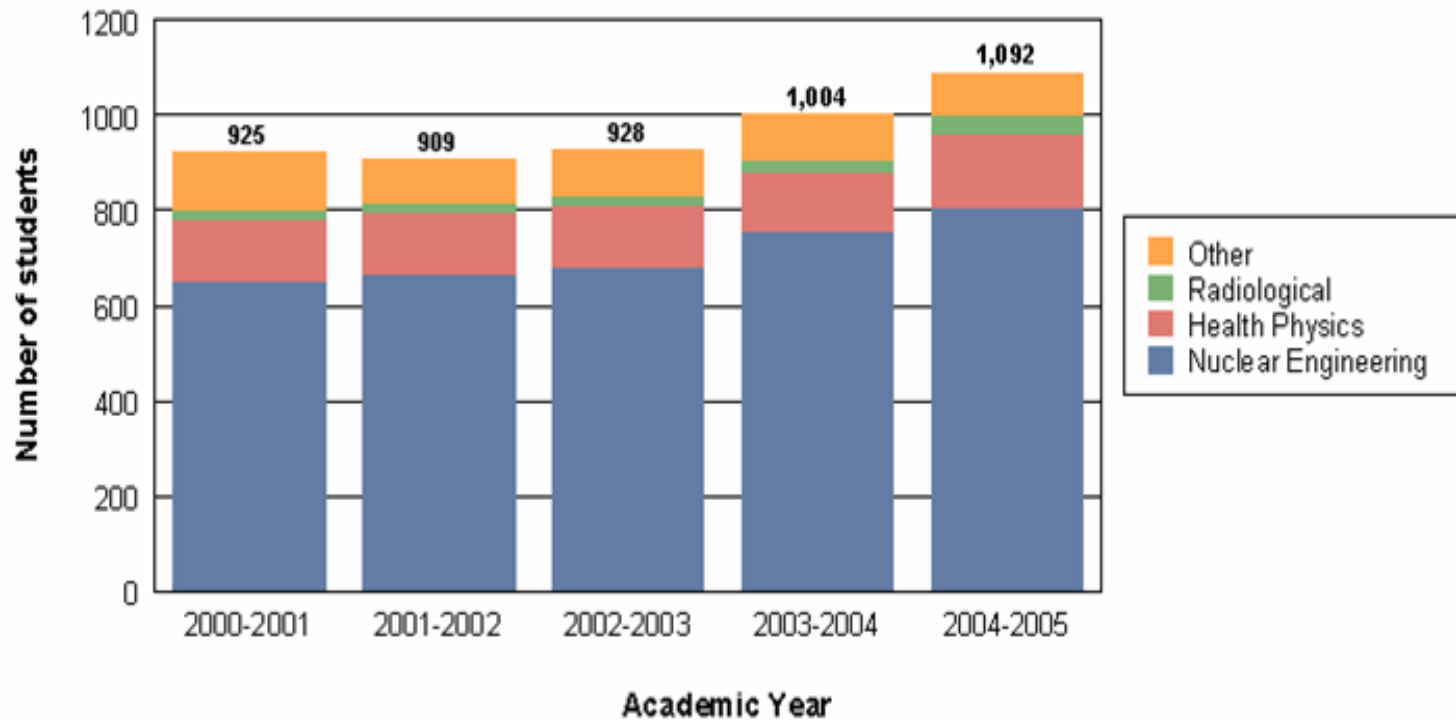
Science and Engineering Indicators 2006



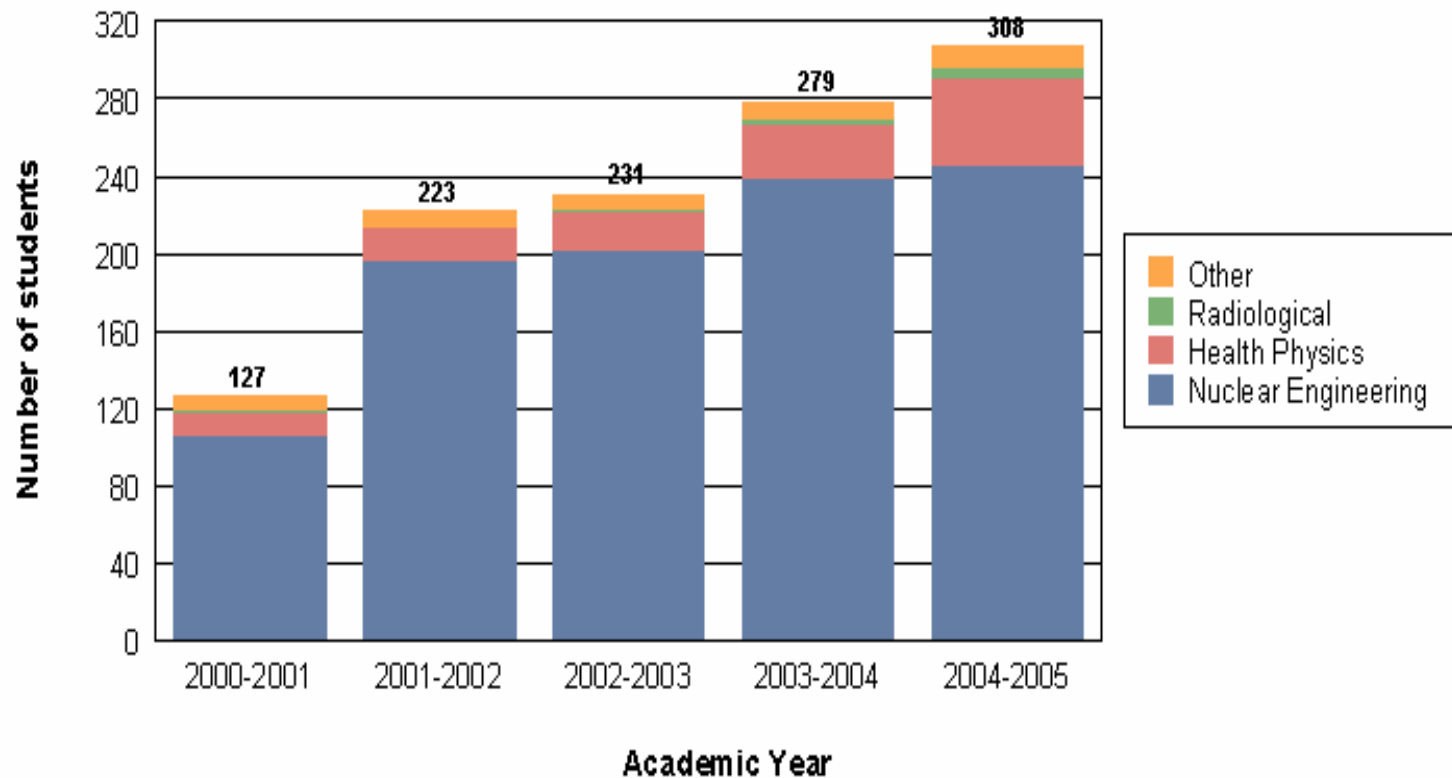
National Undergraduate Enrolment



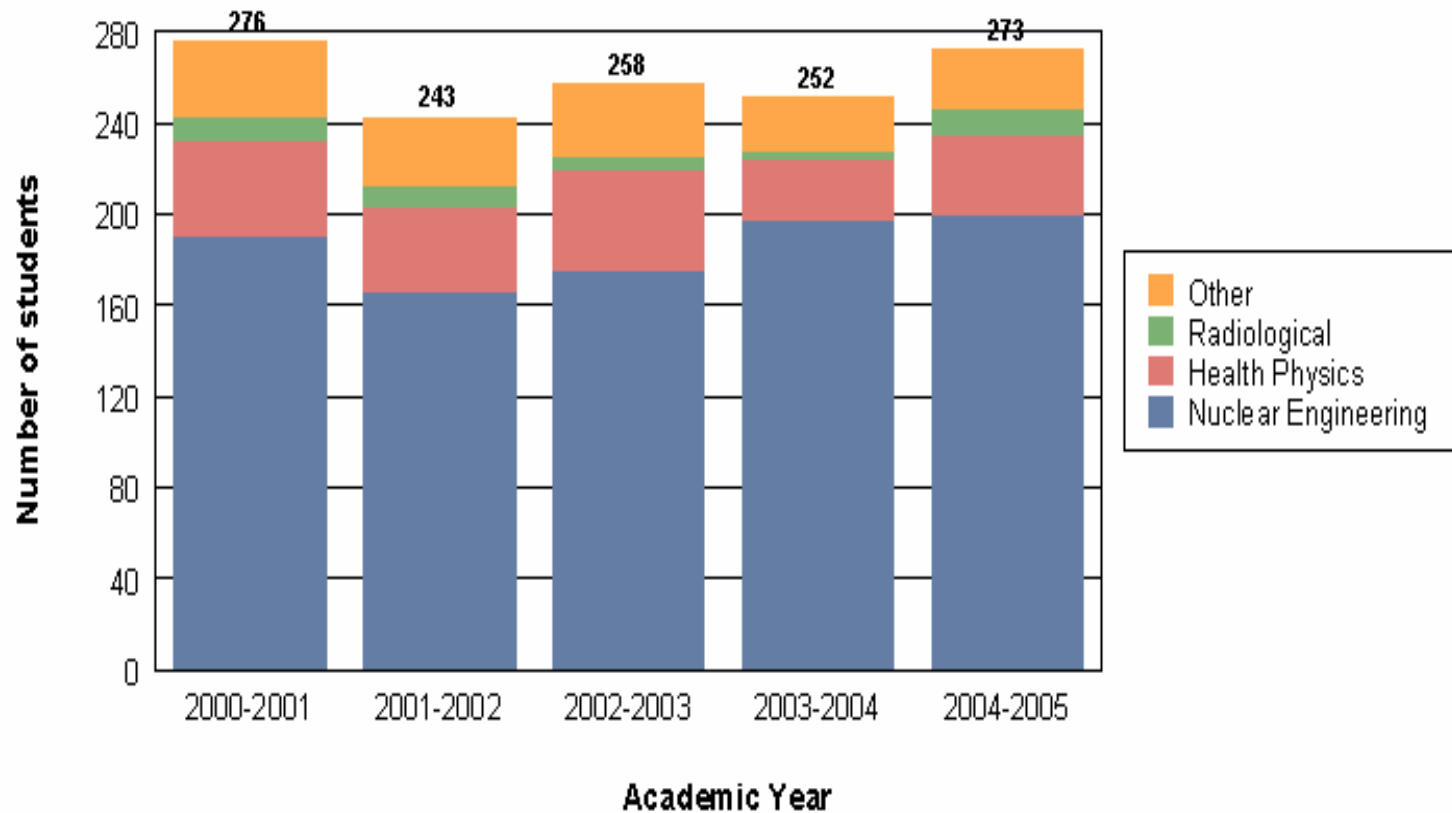
National Graduate Enrolment



National Undergraduate Degrees Conferred



National Graduate Degrees Conferred



NCSU Nuclear Engineering Undergraduate Outreach

Student Focus

School Visits

University & Engineering Open Houses

Young Investigators' Summer Program

Undeclared Engineering & First Year College activities

Educator Focus

NC Science Teachers' Association Conference w/ NC HPS

Nuclear Engineering Science Teachers' Workshop w/ PE

Dept. of Energy's Harnessed Atom



NCSU Nuclear Engineering Graduate Outreach

Internal Students

Accelerated master's programs
Internal pipeline to MS, MNE, PhD degrees

External Students

On-campus, national, & international pipelines
Graduate school fairs
Professional conferences
Faculty recommendations



NCSU Nuclear Engineering Retention Initiatives.1

- Nuclear Engineering Student Research Programs
- NC State (Under)graduate Research Symposia
- Professional Development Opportunities
 - e.g. ANS Mark Mills Awards
- Student Reactor Program
- Career Development Series
- Graduate Research Seminar Series
- Distinguished Lecture Series



NCSU Nuclear Engineering Retention Initiatives.2

- Scholarships: national & departmental
- Summer Internships
- Co-operative Education
- Graduate Traineeships & Fellowships
- Full time positions

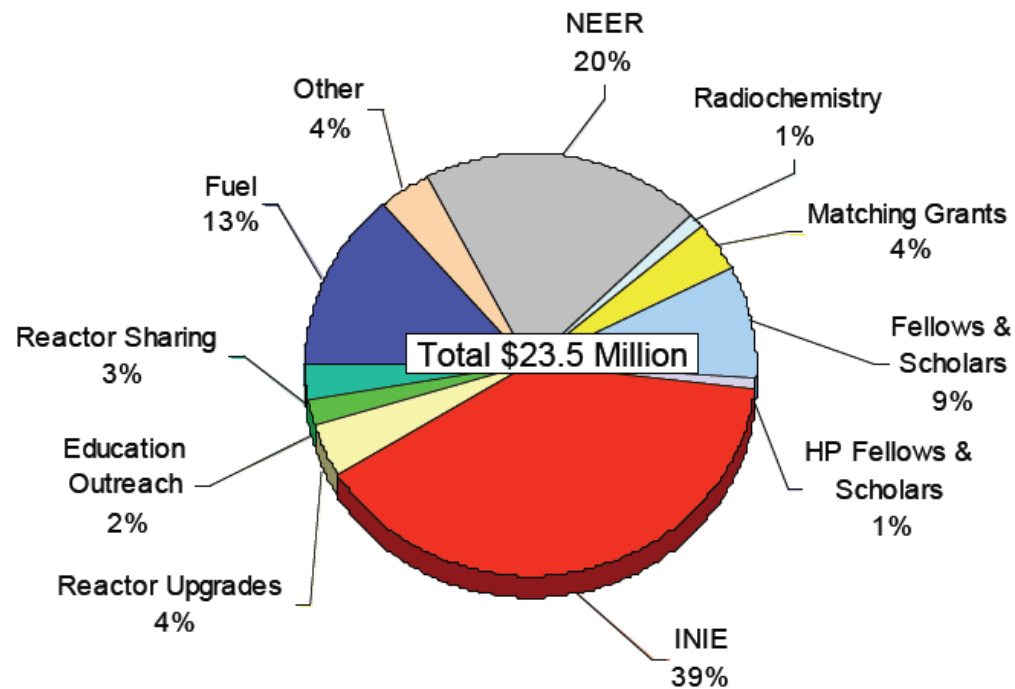


Federal Support

Office of Nuclear Energy, Science and Technology



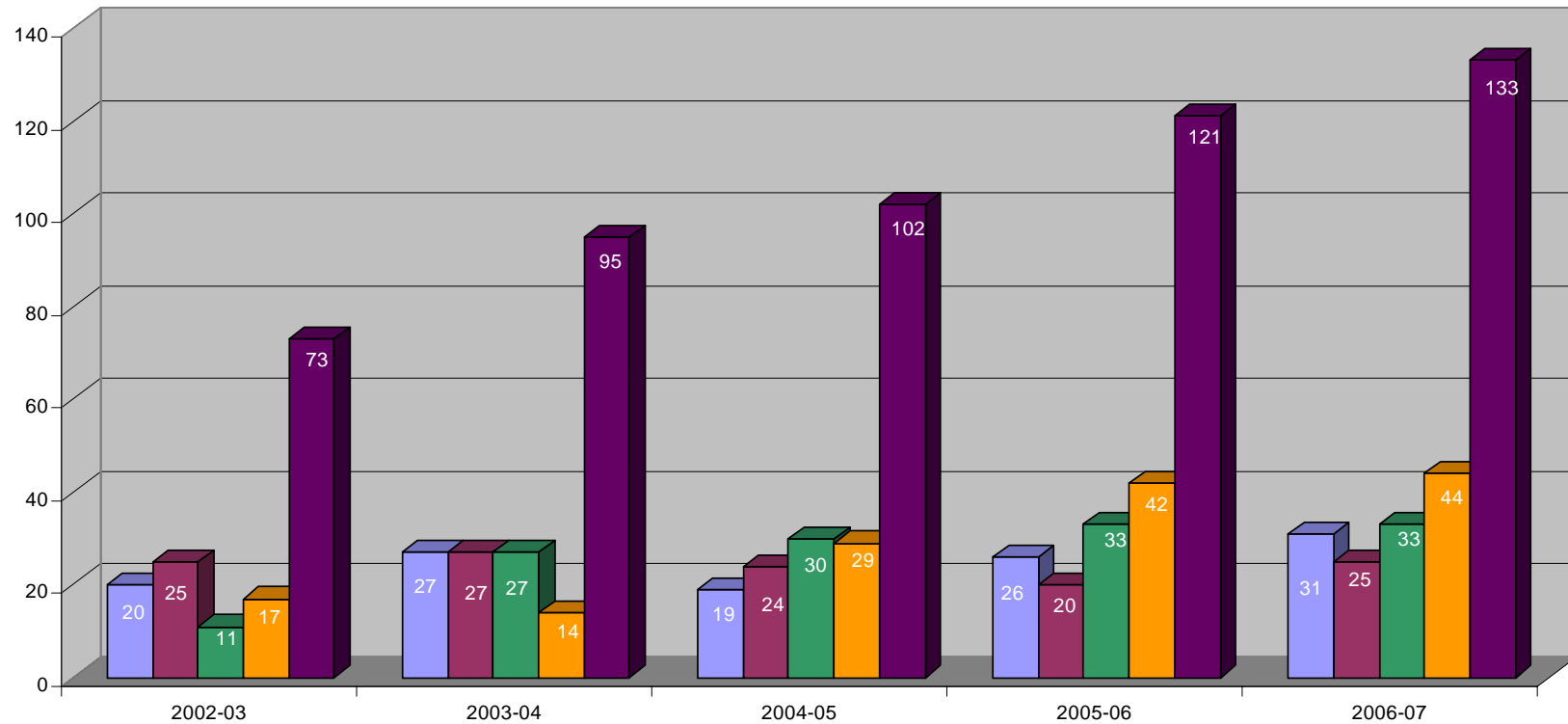
University Reactor Infrastructure and Education Assistance Program – FY 2005



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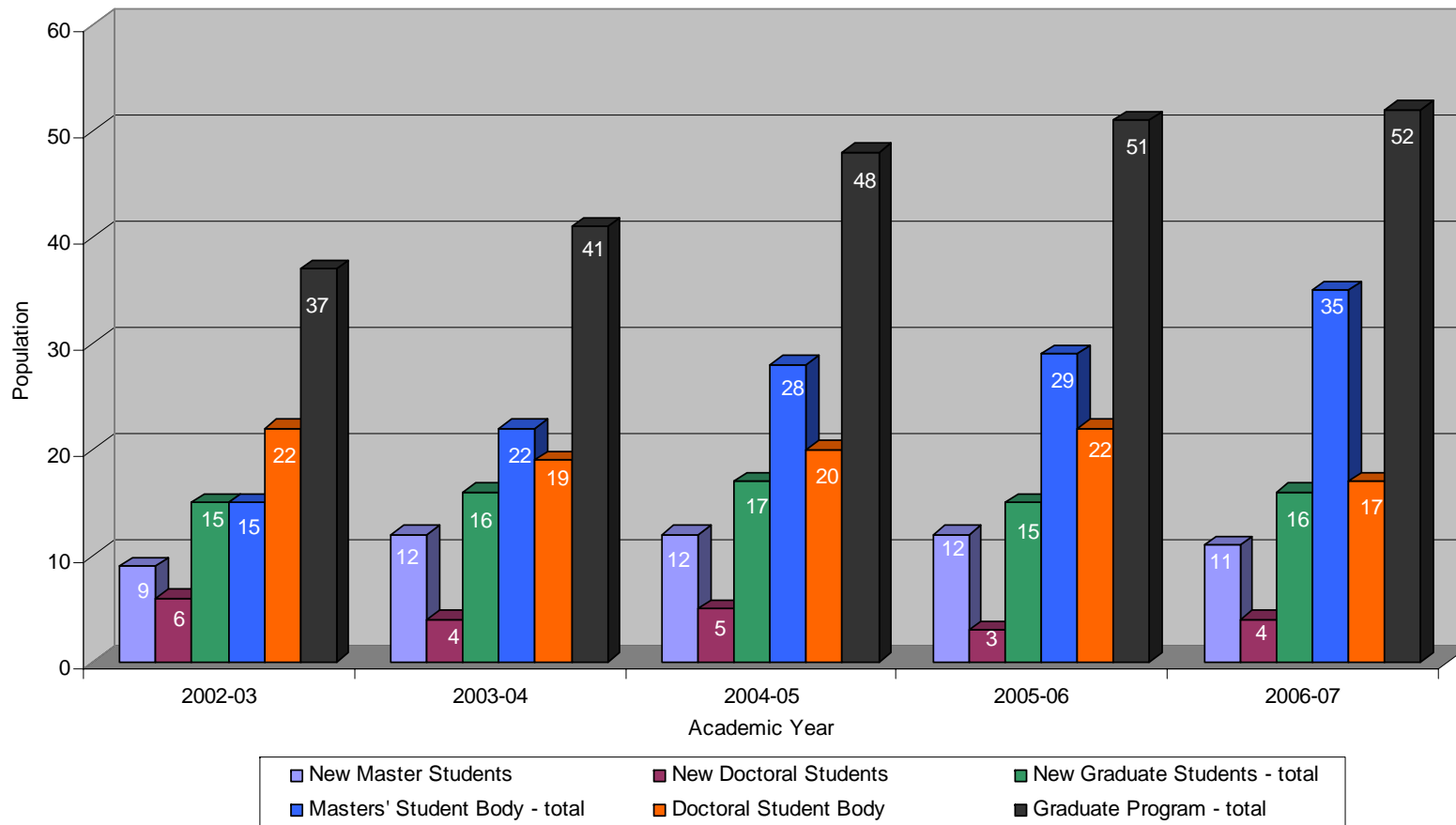
NCSU Undergraduate Student Enrollment



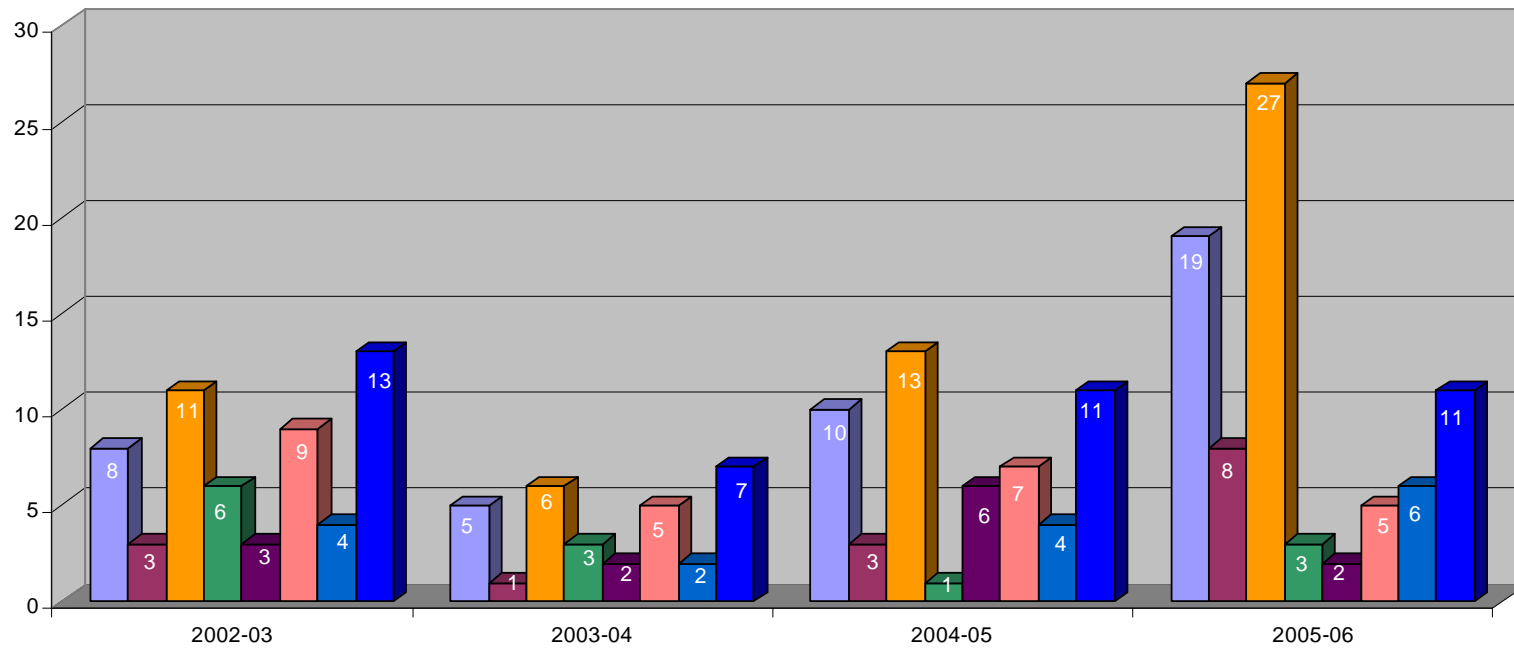
■ Freshman Students ■ Sophomore Students ■ Junior Students ■ Senior Students ■ Undergraduate - total



NCSU Graduate Student Enrollment



NCSU Degrees Conferred



- B.S. in Nuclear Engineering
- Total Undergraduate Degrees Conferred
- Graduates - Master of Nuclear Engineering
- Graduates - Ph.D.
- B.S. in Engineering, Nuclear Power concentration (last class in Dec 2005)
- Graduates - M.S. in Nuclear Engineering
- Graduates - Masters total
- Total Graduate Degrees Conferred





Comments, Questions ??

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NC State's Nuclear Engineering Program

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