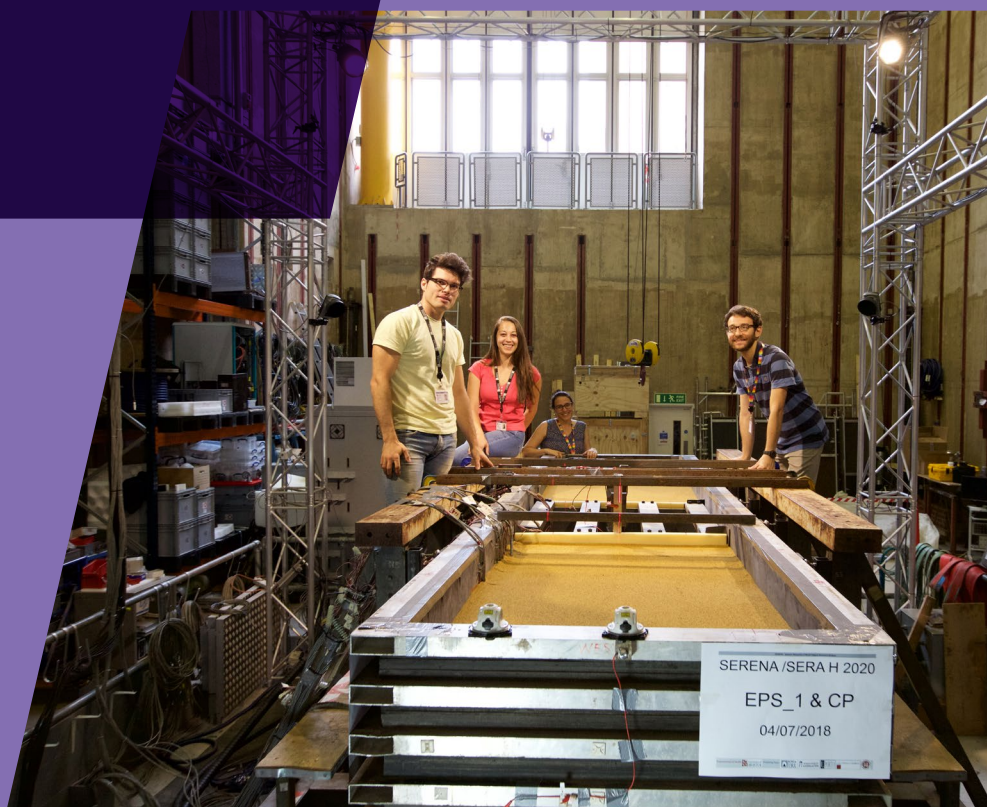
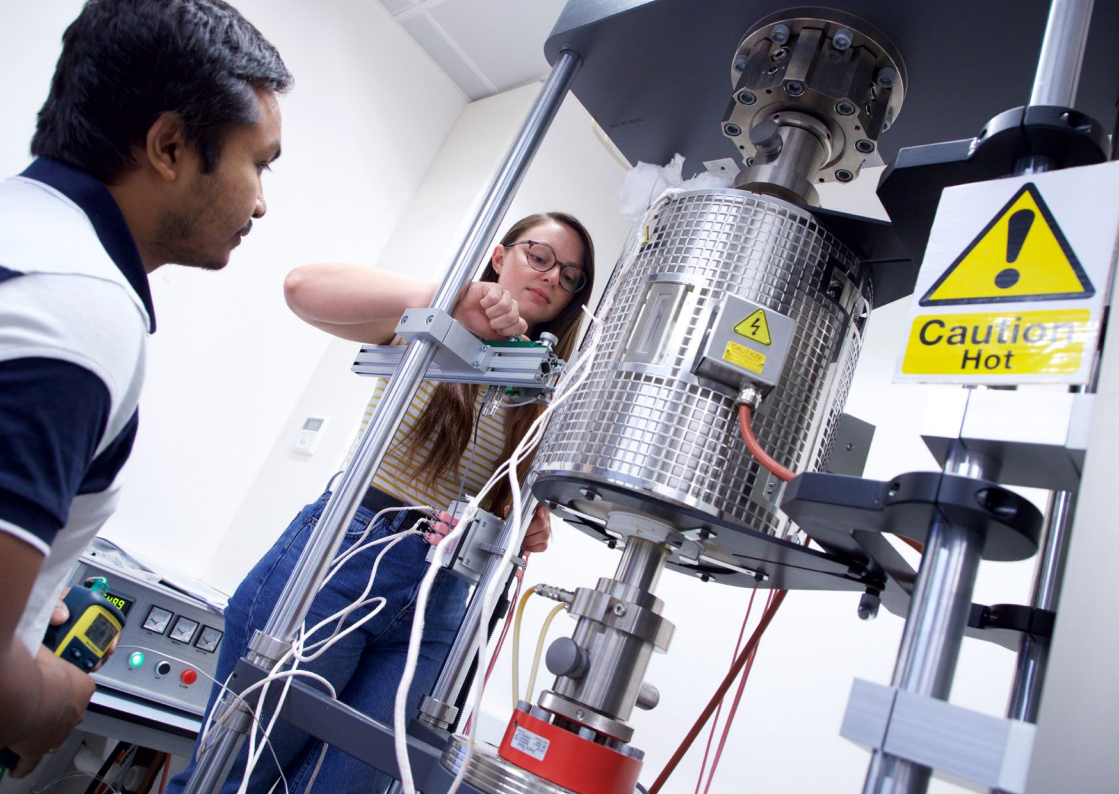


# MSc Nuclear Science and Engineering





This MSc will prepare students for a career either in industry or academia by providing a thorough grounding in the science and engineering underpinning today's nuclear energy systems. Combining the strengths of the Science and Engineering faculties, and drawing on an established programme of nationally leading\* industrial research through the Bristol-Oxford Nuclear Research Centre, the course provides a unique multidisciplinary experience and is a key part of the South West Nuclear Hub.

## Cutting-edge research

The MSc delivers a solid grounding in the science and engineering principles that underpin the global nuclear industry.

Throughout the programme students benefit from links to the University of Bristol's nationally leading research and its industrial sponsors. This environment of collaboration with key industrial partners enriches the learning experience and exposes students to the scientific and engineering challenges facing nuclear energy today.

**"The Hub has a lot of opportunities for students to achieve their goals such as internships from industrial partners, PhD funding, a nuclear career fair and much more."**

**"I got to experience two different sides to nuclear, both the engineering and physics side were covered, which gives a flexibility other courses may not give."**

**Recent MSC graduates**



Left image: Students in the Engineering creep laboratory

\* (left) The University was ranked #1 for nuclear energy research in Sir Andrew Witty's 'Review of Universities and Growth' [BIS/13/1241]



## Projects

### Group Projects

Students with different backgrounds (e.g. science and engineering) are mixed to make groups of 4-5 working together on a nuclear themed topic. Groups will be assigned a University facilitator and an industrial contact and will cover all aspects of the project in detail, focusing in particular on group dynamics and group management. They will then present their final findings together to a panel of academics and industry experts at the end of the second semester.

Projects in previous years have been linked to Cavendish Nuclear, Culham Centre for Fusion Energy (CCFE), Assystem Energy & Infrastructure Limited, EDF Energy, Hydrock, National Nuclear Laboratory (NNL) and Sellafield.



MSc students visiting Assystem Energy & Infrastructure Limited as part of their group project

### Individual Research Projects

Research projects are overseen by supervisors from Mechanical Engineering/Civil Engineering/Physics/Chemistry and Earth Sciences. The Individual Research Projects normally involve an extended investigation into the application of a novel component or technique, and they offer the opportunity for an indepth study of a specialised subject. Each project is carried out under the supervision of a member of staff. The project contains a research or investigative element which allows a student to demonstrate individual talent and intellectual ability. It attempts to mirror a research and/or development project of the type that may be encountered upon graduation and as such contains elements of project planning. The project report provides an opportunity for the student to demonstrate report structuring and writing skills.

These projects have academic supervision, but will often be accompanied by industrial support and most of the projects will be aligned to important industrial problems.

Potential project contributions for the nuclear MSc will come from strategic partners EDF Energy, Sellafield, NNL, Rolls-Royce, Radioactive Waste Management and Cavendish Nuclear. At the University of Bristol we have access to a large suite of instrumentation, some of which is dedicated specifically to nuclear materials research. Some of the research instruments are unique in the UK. Students may also have the opportunity to work on the sites of the project partners.

## International Opportunities

**The Nuclear Science and Engineering programme** offers students numerous opportunities to collaborate with partner institutions, such as Institute Polytechnique de Grenoble (INP), École Nationale Supérieure d'Arts et Métiers (ENSAM), the Materials Ageing Institute (MAI) and Hitachi-GE Internships.



MSc student on the three month Hitachi-GE Internship in Japan, 2017

## Sponsorship Opportunities

Both Jacobs and EDF Energy sponsor some of our research projects giving them a bursary towards their study, as well as a three-month research project and a mentor. EDF Energy also offer streamlining directly into the EDF Energy graduate assessment centre.

## Nuclear Industry Links

Developed and delivered in partnership with industry, this MSc programme includes a focus on nuclear professionalism. Graduates will leave equipped with a familiarity with the nuclear industry and its unique safety culture, preparing them to enter the industry or continue in academia.



## Careers Day

The Nuclear Hub holds a careers day every October hosting a number of employees from the nuclear sector, from the Bristol area and beyond. Students are able to listen to presentations about each company and their role within the industry and network with the speakers providing an invaluable opportunity to find out detailed information about potential career paths.

Recent graduates have secured careers within the nuclear industry in places such as EDF Energy, Office for Nuclear Regulation (ONR), Dounreay, Atkins, Magnox, Wood Group, Corporate Risk Associates (CRA) and Frazer Nash Consultancy (FNC).



## Course structure

Nuclear Energy is a vital part of the UK strategy to prevent climate change and secure the electricity supply of the future. The MSc in Nuclear Science and Engineering at the University of Bristol trains students to be the future experts of the industry. Classes will teach about the construction and design of nuclear fission and fusion power, decommissioning of existing facilities and management of the fuel cycle and waste.

The programme is delivered full-time over one year by the University of Bristol. Students will form a cohort attached to the South West Nuclear Hub, and will benefit from working with internationally leading research teams.

**The MSc contains a total of 180 credit points (CP), split between taught and practical elements**

### Core Units:

- Fundamentals of Nuclear Science
- Nuclear Reactor Engineering
- Nuclear Materials Behaviour
- Nuclear Reactor Physics
- Nuclear Fuel Cycle
- Research Skills
- Group Projects
- Individual Research Project

**The Taught Programme** consists of core units, which provide a solid foundation in the scientific and engineering subjects, and optional units, which offer an opportunity to explore topics of particular interest. Students are encouraged to broaden outside their discipline by the requirement to select at least ten credit points from the Faculty outside their individual research project.

**The Practical Programme** consists of the Group Project and the Individual Research Project. The Group Project brings students together in interdisciplinary teams to tackle current problems facing the nuclear industry, e.g. Challenge Events posed by the University's industrial partners such as EDF Energy, Sellafield, CCFE, NNL, Rolls-Royce, RWM and Cavendish Nuclear. These help students develop key skills sought by employers such as innovation, communication and leadership. The student's Individual Research Project is supervised by leading academics at the University of Bristol, and is often aligned with key industrial partners, offering an opportunity to experience the industry's technical challenges and professional culture first-hand.

---

# How to apply

## Fees and Funding

Information is available at: [bristol.ac.uk/study/postgraduate](http://bristol.ac.uk/study/postgraduate), search for 'nuclear'. Sponsorship from nuclear industry partners, to cover all or part of the course fees, will be awarded on the basis of academic merit.

## Entry Requirements

Applicants will be considered individually, but a 2:1 or better in an engineering or science degree will be expected. Contact the MSc team directly to discuss eligibility.

## Contact Information

Email: [nuclear-msc@bristol.ac.uk](mailto:nuclear-msc@bristol.ac.uk)

Hub: [southwestnuclearhub.ac.uk](http://southwestnuclearhub.ac.uk)

University guide to the city of Bristol  
[bristol.ac.uk/citybristol](http://bristol.ac.uk/citybristol)



@ChooseBristolPG



[bristol.ac.uk/vip](http://bristol.ac.uk/vip)



UniversityofBristol



**SOUTH WEST  
NUCLEAR HUB**

Photography: © University of Bristol

The information contained in this leaflet is correct at the time of printing (November 2018). Courses and facilities are liable to alter or be withdrawn at the University's discretion.