



Educating the Nuclear Leaders of Tomorrow MPhil Programme in Nuclear Energy

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A one year full-time Masters qualification at University of Cambridge

Department of Engineering • Department of Physics • Judge Business School

Department of Materials Science & Metallurgy • Department of Earth Sciences

Nuclear Principles • Industry Practice • Business Management



Course objectives:

- Provide a thorough grounding in engineering, scientific and safety aspects of nuclear power;
- Provide a good understanding of nuclear technology policy together with relevant business understanding;
- Provide an appreciation of the wider policy contexts of electricity generation in the 21st century.

Prime focus is to equip students for roles in industry, course provides a path to research by preparing for a PhD

Core Subjects

Core Topic	Scope
Reactor Physics	Core physics & shielding – steady state power & shapes, depletion control elements & use of poisons, core kinetics & system control.
Reactor Engineering & Heat Transfer	Coolant types, thermal cycles, heat transfer, thermal limits – reactor systems, their optimisation and operating characteristics including normal operation & how to address main types of fault condition.
Fuel Cycle, Waste & Decommissioning	Whole fuel cycle: mining to waste & how waste is managed, decommissioning principles.
Fuel & Reactor Materials	Fuel and reactor materials – including selection, safety and life issues – radiation behaviour & damage, structural integrity & fracture mechanics, EAC.
Safety & Advanced Systems	Safety philosophies, impact on design, justification approaches, control & reliability, advanced systems including Gen IV, Thorium & Fusion
Nuclear Technology Policy	Energy studies & climate change, economics of energy, nuclear politics, proliferation & physical security.

Nuclear Industry Support



- Strategic partners
- Help defining teaching curriculum
- Interact with students
- Suggest and supervise projects
- Provide financial support

Special Features

Nuclear Energy has a strong practical element allied to its engineering and scientific foundations. The course provides for this practical element by:

- Supplementing the teaching by leading industry practitioners;
- Engagement with industry and external research through projects and sponsorship;
- Use of Cambridge's international and research links;
- Distinguished lectures and seminars;

Find out more at: www-diva.eng.cam.ac.uk/mphil-in-nuclear-energy

