Professional Education on Nuclear Energy

Starts on 1st of June
Apply now!
In the ever-changing European and global energy sectors, one thing remains constant: the interest in nuclear power. This interest can be found not only in numerous developed countries, among which several EU Member States, but also in an increasing number of emerging/developing economies which have started to take the potential of nuclear power seriously into account. As a result, the demand for highly educated nuclear engineers and scientists in industry, research, technical safety and governmental organisations is increasing. A highly skilled and up-to-date workforce plays a crucial role in responsibly maintaining the civil nuclear reactor fleet and decommissioning obsolete plants. In addition to this, it is imperative to involve a well-educated workforce in designing and building new nuclear infrastructure and in dealing with radioactive wastes.

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Therefore high quality education and training for workforce is essential for the future of the nuclear power sector. In an effort to stimulate and coordinate training in this field, the European Commission has recently brought together 11 leading academic and research institutions in Europe and a range of other stakeholders to create a sustainable lifelong training programme in the field of nuclear fission technology. This co-called GENTLE network offers professionals the opportunity to enrol in the Professional Education on Nuclear Energy, a unique programme designed by Europe's leading experts to meet the needs of nuclear industries, research and technical safety organisations.

Expertise

The GENTLE network that coordinates the course consist of Delft University of Technology (The Netherlands), Budapest University of Technology (Hungary), the CIRTEN interuniversity consortium for technological nuclear research (Italy), Karlsruhe Institute of Technology (Germany), Technical University of Madrid (Spain), The Belgian Nuclear Research Centre SCK•CEN (Belgium), The University of Manchester (UK), Paul Scherrer Institute (Switzerland), University of Tartu (Estonia), Lappeenranta University of Technology (Finland) and the Joint Research Centre of the European Commission. Learn more about the GENLTE network on gentleproject.eu.

Benefits

- Several large nuclear organisations support the course; participants have the opportunity to create links with the top employers in the nuclear industry.
- Eleven leading European institutes contribute to the curriculum, all supplying their unique specialism.
- The scope of the programme is truly international, with contact days in several countries.
- This modular programme covers all base theoretical and practical aspects regarding nuclear energy. Each module can be attended separately as its content covers the full scope of the module topic.
- The programme offers a hands-on approach, which includes extensive practical training.
Programme
Attending the full programme takes a little bit over one year and consists of five modular parts. All modules can also be followed separately, if this suits your needs better. The first four modules aim to provide the participants with the suitable background and the specific knowledge about Nuclear Energy Systems and their main features through lectures, instructions and site visits. The fifth module is devoted to provide soft skills that are critical in the nuclear sector.

Topics
Module 1 – Understanding nuclear power - Delft University of Technology - June 2015
• Societal, economical and technical perspectives on nuclear energy
• Fundamentals of nuclear science, nuclear chemistry, thermal hydraulics, radiation protection and nuclear reactor physics
• Nuclear fuel cycle and waste management

Module 2 – Producing energy with nuclear reactors - Karlsruhe Institute of Technology - October 2015
• Principles of energy generation with nuclear reactors
• LWR systems for energy generation and conversion including safety systems (PWR, VVER and BWR)
• Operational aspects of PWR
• Fundamentals of neutron physical and thermal hydraulic core design (principles, current methods, trends)
• Dynamic behaviour of LWRs
• One-day visit of the training reactor of IKE Stuttgart University (experiments, measurements)

Module 3 – Nuclear fuel from ore to waste - Joint Research Centre - Karlsruhe - February 2016
• Fundamentals of actinides chemistry and physics
• Where nuclear fuel comes from?
• How does it behave in the reactor?
• What to do with used fuel nuclear fuel afterwards?
• Existing technologies and future developments

Module 4 – Societal justification, safety and security of nuclear energy - SCK•CEN - Mol - April 2016
• Science, politics and ethics of nuclear technology assessment
• Nuclear safeguards and security aspects
• Nuclear safety aspects (deterministic and probabilistic approaches)
• Nuclear safety culture and methodologies for safety assessment
• Decommissioning of nuclear plants issues

Module 5 – Management systems - CIRTEN - Milan - June 2016
• Quality management principles
• Project management issues
• General soft skills
• Insights into the interaction processes with Safety Authorities and Regulatory Bodies

For more information about the specific dates of the modules we refer to the nuclear energy website.

Target group
The Professional Education on Nuclear Energy course is designed for professionals positioned in industry, consultancy companies, research organisations, (inter) governmental organisations and regulatory bodies. The programme is especially attractive for professionals (e.g. more than 3 years working experience) who have an MSc level degree in a technological/scientific area but who do not have a nuclear engineering background. The programme is open to qualified candidates from all over the world.

Study load
Every module has a workload of 8 ECTS credits. The modules have 80 face-to-face lecture hours combined with 140 hours for preparation, distant learning and homework assignments.

The total programme duration is little bit more than one year and upon successful completion of every individual module, you will receive a certification.

Tuition fee
In 2015 the programme will be offered for the introductory price of €18,000.00 per participant for the complete programme. Individual modules can be attended individually for a price of €3,600.00 per module.

These tuition fees cover all necessary costs; the complete study programme, books, access to student facilities, excursions, hotel and all the meals for the programme duration. (Travel arrangements to and from the lecture locations are not included).
You will visit 5 nuclear institutes

The Professional Education on Nuclear Energy offers you inside knowledge from 11 leading nuclear research institutes in Europe. You will have the extraordinary opportunity to visit 5 nuclear centres of expertise and learn firsthand about nuclear energy systems. The remaining partners will join you in these 5 locations to give you the best nuclear education possible.

Module 1 takes place at the Reactor Institute Delft (RID) at Delft University of Technology. Here you will visit a pool-type nuclear reactor, built specifically as a source of neutrons and positrons for fundamental and applied scientific research into areas such as health and sustainable energy. During Module 2, held at the Institute for Nuclear Waste Disposal (INE) of the Karlsruhe Institute of Technology, you will experience facilities to study the geochemical aspects of the long-term safety of nuclear waste disposal, equipped for working with radionuclides of all types including reactor fuels and alpha emitters. Module 3 is led by the JRC Institute for Transuranium Elements (ITU) in Karlsruhe, which is an inspiring location as its laboratories are equipped to deal with all stages of the fuel cycle. Module 4 is held at the Belgian Nuclear Research Centre (SCK\-CEN), home to three operational research reactors, one in the process of being decommissioned and an underground laboratory dedicated to the study of potential geological host formations for long-lived and highly active nuclear waste. Finally, Module 5 takes place in Milan at CIRTEN, the joint centre of nuclear expertise of 6 universities in Italy, where you will learn everything about nuclear management systems.

Stakeholders

The stakeholders are in dialogue with the partners to define the programme content. The stakeholders involved are AREVA (France), CNU (Romania), Eesti Energia (Estonia), ENEN (France), ENS (Belgium), FORATOM (France), NNL (UK), NRG (Netherlands), NUGENIA, SNETP (France), TVO (Finland), Urenco (Netherlands), Westinghouse (Sweden).

Partners

The following partners contribute to the Professional Education on Nuclear Energy programme.

Contact

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The information presented in the previous paragraphs is only indicative of the scope and characteristics of the Professional Education on Nuclear Energy course. More detailed information about the course and modules will be disclosed in due time. The content of this document reflects only the views of the author(s). The European Union is not liable for any use that may be made of the information contained therein.

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