



Thanks to its thorough experience in the field of peaceful applications of nuclear science and technology SCK•CEN has garnered a reputation as an outstanding centre of not only research, but also education and training (E&T). The E&T activities at SCK•CEN cover a. o. reactor physics, reactor operation, reactor engineering, radiation protection, decommissioning and waste management.

Our courses are directed to the nuclear industry, the medical and the non-nuclear industry, national and international policy organizations, the academic world and the general public. E&T programs are also organized in cooperation with universities, technical universities, nuclear power plants and public and private health services. In addition, the SCK•CEN is involved in international E&T research networks and programs such as ENETRAP, EUTERP, EUNDETRAF, CETRAD, BNEN and ENEN.

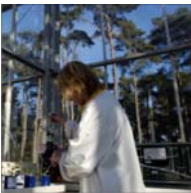


Next to courses, SCK•CEN also offers students the possibility to perform their research work at our laboratories. Final-year students and Ph.D. candidates can enter a programme defined by an SCK•CEN mentor, in close collaboration with a university promotor. Post-docs are mainly recruited in specialised research domains that reflect the priority programmes and R&D topics of our institute.



Topics

At the technical domain of SCK•CEN in Mol, following E&T activities are organized:



Master of nuclear engineering

The objective of the master in nuclear engineering is to offer present and future professionals and researchers a solid background in the different disciplines of nuclear engineering. It is a one year program organized by major Belgian universities in collaboration with the Belgian Nuclear Research Centre. The program is taught in English. Its high modularity allows for optimal time management for teachers and students, it facilitates individual participation in selected courses e.g. advanced courses in the context of continuous professional development and it also facilitates foreign students participation in blocs of courses.



Nuclear reactor physics course and reactor operation training for operators

To guarantee the safe operation of present and future nuclear reactors the initial and continuous training of reactor operators has proven to be indispensable. In most countries, such training also results from the direct request from the safety authorities to assure the high level of competence of the staff in nuclear reactors. At present, SCK•CEN organizes such a course for the reactor operators of the BR2-reactor (MTR) at the SCK•CEN site and for the reactor operators and operation team heads of the PWR's situated at the DOEL-site (Belgium). This course covers nuclear reactor statics and kinetics. In addition to the theoretical courses, lab sessions on the BR1 and VENUS research reactors at the SCK•CEN are organized.



Training courses on reactor operation are also organized on service basis for nuclear engineering Master students of various Belgian and foreign universities and technical universities.



Radiation protection courses

SCK•CEN's isRP (international school for Radiological Protection) coordinates and organizes courses which deal with all aspects of radiation protection. The series "background and basic knowledge" consists of seven modules (nuclear physics, interaction of radiation with matter, radiation and dose measurements, biological effects, gamma spectrometry, legislation and ALARA and safety culture) and provides the theoretical and practical knowledge required for implementing RP aspects in an industrial or medical working environment, both in daily practice and in long-term management. A course program can be extended with one or more modules from the "nuclear and radiological expertise" series (a.o. radon and natural radioactivity, nuclear transport, on-site accident management, organization of emergency planning, radiochemistry, ethical aspects of the radiological risk, ...), depending on the specific working environment of the students. On-site practical training exercises are organized and visits to different SCK•CEN installations and laboratories can be included.





VISIPLAN 3D ALARA planning tool

The application of ALARA and the dose assessment for work in complex environments is a complicated task. Dose values are influenced by the geometry of the installation, the source distribution, the shielding configuration and the work organization. VISIPLAN 3D ALARA planning tool is a PC-based program developed for the ALARA analyst or the person responsible for the assessment of the dose uptake of the workers. It allows to assess the radiation doses in a 3D environment and to compare different work scenarios. A three day course explains the VISIPLAN features.



Nuclear emergency management training course

Off-site nuclear emergency management concepts have been reviewed in-depth after the Chernobyl accident. SCK•CEN transmits its know-how in this field by a one-week European training course on "Preparedness and response for nuclear or radiological emergencies". The course aims at giving a comprehensive overview of off-site nuclear emergency management, its principles and their application to those involved in emergency planning and response, e.g. health physicists, technical and radiological advisors, civil and environmental protection officers. It covers the following major topics: principles of intervention, radiological evaluations, decision-aiding techniques and the decision-making process leading to optimized management options. The European and international dimension of the subject is treated (e.g. Community legislation, ECURIE and EURDEP). Other topics such as health effects, economic consequences and psycho/social aspects are also included.



Decommissioning of nuclear installations

The course objective is to disseminate know-how and experience on decommissioning of nuclear installations. The course aims at dismantling project managers, safety engineers, health physicists, decontamination and dismantling operators. The course is also of interest to governmental and regulatory bodies dealing with decommissioning.



Training courses on radioactive waste disposal

Customized training courses are offered in the field of long-term radioactive waste management. The courses focus on final disposal as the preferred option to long-term radwaste management. Waste disposal requires selection and thorough characterization of a site, characterization of waste packages, and finally demonstration of long-term safety by means of performance and safety assessment. Courses are generally organized in three areas that are very closely linked, i.e.

- Characterization of radioactive waste packages in relation with its disposal;
- Site selection and site characterization;
- Integrated safety assessment modelling.



Training courses typically last for one up to two weeks and generally include hands-on computer sessions, technical workshops or field visits. The courses are intended for individuals having a controlling or supervising role within radwaste agencies or nuclear control bodies, or for technical experts that carry out the characterization of an existing or new site, that characterize waste packages, or that perform post-close assessments.



Practical

Except for the Master in nuclear engineering, all course programs can be tailored to the needs of the students and are available to fit into a larger modular program.

The courses can be taught at SCK•CEN's Conference Centre, offering fully equipped lecture rooms or at the venue of the customer. The Conference Centre is located next to the technical domain of SCK•CEN, allowing easy access for the practical training sessions. Several laboratories and installations such as the BR1 and VENUS reactors are available and open to national and foreign students.

The team of lecturers includes engineers, physicists, technicians, biologists, physicians and social scientists who all bring insights and ideas from their specific background into the course programs. As SCK•CEN staff members they have a solid knowledge and experience in their field, and can thus directly transfer their theoretical knowledge and practical experience to the various courses.



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