



Monthly Bulletin

This project has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 661910

JANUARY 7TH, 2019

ISSUE NO. 8

In this bulletin

In this issue, we present an updated list of courses **adding new information** on **pre-existing and new courses**. There is still a **plenty of places** in interesting courses, while **courses by NTEC and University of Manchester are mostly saturated**. So, please diversify your choices.

We again suggest that, **if you apply for support by the ENEN+ project, you should prompt the Course Providers about this request, soon at the time of being contacted**. Please **decide if you want to apply on your own or let the Course Providers apply for you, carefully avoiding duplication of applications**.

Please, also read the ENEN+ [Mobility Manual](#) for knowing the conditions for applications and avoid rejection.

We had up to now more than 120 applications most of them for multiple courses.

Thanks for your interest in our courses!

[Link to the course application page](#)

[Link for asking support for mobility to the ENEN+ project](#)

**PLEASE LOOK ALSO AT THE COMPLETE OFFER
FOR LAST MINUTE SELECTION OF COURSES ALREADY ADVERTISED**

NEW: COURSES BY UNIVERSIDAD POLITECNICA DE MADRID



POLITÉCNICA

Course on Radioactive Waste Management (in Spanish)

Course Outline and Content

Along 35 lessons, the course depicts the general aspects of generation, treatment and conditioning of radioactive wastes, the basic Safety and Radiological Protection criteria, the detailed technical questions of the management of both low-and-intermediate-activity wastes and the high-activity level, together with the wastes generated during decommissioning and dismantling of installations, as well as the general and institutional aspects. Experts in each field, belonging either to ENRESA, CIEMAT, the Spanish Nuclear Safety Council (CSN), the UPM and the industry, present such wide programme.

The course is made of the following lectures:

- 1 – Generation, treatment and conditioning of wastes (7,5 hours)
- 2 – Basic safety and radiological protection criteria (10,5 hours)
- 3 – Management of very Low, Low and Intermediate specific activity level wastes (12 hours)
- 4 – Management of High specific activity level radioactive wastes (14 hours)
- 5 – Decommissioning and dismantling of nuclear installations (8,5 hours)
- 6 – General and institutional aspects (7,5 hours)

Requested Background

The course is designed for Master and Postgraduate level students.

Teachers

Eduardo Gallego (UPM), Agustin Alonso (UPM), Patxi Elorza (UPM), Enresa Staff, Ciemat Staff, CSN Staff

Method of Delivery: In presence lectures. On request, lectures can be followed by external students.

Date of availability: 1st February – 18th May 2019, semester course

Course on Nuclear Technology (in English, possibility of delivery in compact form)

Course Outline and Content

Nuclear Technology provides the fundamental description of the science and technology involved in the operation of a nuclear reactor. After a short introduction to the nuclear plants, the subject continues with the basic notions of neutronics and thermal hydraulics. Then, a deep view of the components, systems and operation of a nuclear light water reactor is provided, both PWR and BWR. Once the basic concepts about a reactor are build, the course begin with more advanced topics. The first of them is an introduction to Nuclear Safety, with a short view on the historical accidents (Three Mile Island, Chernobyl and Fukushima). To finish the subject, the students get a brief knowledge about Generation III/III+ and IV reactors.

The course is made of the following lectures:

- 1 – Introduction to Nuclear Power Plants (4 hours)
- 2 – Neutronics and Thermal-Hydraulics Fundamentals (4 hours)
- 3 – Light Water Reactors (14 hours)
- 4 – Introduction to Nuclear Safety (4 hours)
- 5 – Generation III/III+ and IV reactors (4 hours)

Detailed Learning Outcomes are reported at this link

Requested Background

The course is designed for last year bachelor or postgraduate level students.

Teachers

Emilio Minguez (UPM), Gonzalo Jimenez (UPM)

Method of Delivery

In presence lectures. On request, lectures can be followed by external students.

Date of availability: February- June 2019

COMING SOON COURSES

**ANNETTE course on
nuclear safeguards
(4-15 February 2019)**

**Course Outline and Content**

The course is aimed to provide an introduction to nuclear safeguards and the non-proliferation of nuclear weapons. Following the efforts of the European Safeguards Research and Development Association (ESARDA), this ANNETTE course contributes to enlarge the number of university students and young professionals aware of these themes. The course units cover both technical aspects of nuclear safeguards inspections such as radiation detectors and nuclear fuel cycle facilities, as well as the history of nuclear non-proliferation and the relevant legal frameworks.

The course is made of the following units (the indicated time duration is approximate, and totals in the range of 50-60 hours):

- Unit 1 – History of non-proliferation and safeguards (4 hours lectures + case study assignment)
- Unit 2 – Legal frameworks (3-4 hours lectures)
- Unit 3 – Fuel cycle and non-proliferation (4 hours lectures)
- Unit 4 – Nuclear material accountancy (1-2 hours lectures)
- Unit 5 – Probabilistic and statistical methods for nuclear safeguards (4 hours lectures, 4 hours exercises)
- Unit 6 – Export control (4 hours lectures)
- Unit 7 – Implementation of safeguards (4 hours lectures)
- Unit 8 – Containment and Surveillance (C/S) (4 hours lectures)
- Unit 9 – Non-Destructive Assay (NDA) (4 hours lectures + 4 hours hands-on exercises, if possible)

**2-days Workshop on
"Proliferation
Resistance
Methodologies for
Nuclear Installations"**

**SCK•CEN (Brussels),
Belgium
(Deferred to a new date)**

- Unit 10 – Destructive Analysis (DA) (4 hours lectures + 2 hours desk top exercise)
 - Unit 11 – Novel technologies, approaches and methodologies (3-4 hours lectures)
 - Unit 12 – Physical protection (1-2 hours lectures)
 - Unit 13 – Illicit trafficking (3-4 hours lectures)
 - Unit 14 – Upcoming challenges (3-4 hours lectures)
- Detailed Learning Outcomes are reported at [this link](#)

Locations: One week at SCK•CEN (Mol, Belgium), one week at FZJ (Jülich, Germany)

Number of attendees: A maximum of 60 attendees will be accepted

Requested Background: Due to the large scope of the course, no specific background is required to attend the course.

Teachers: The teaching units will be given by researchers from Forschungszentrum Jülich, JRC, SCK•CEN, and Uppsala University. The full list of teachers will be communicated at a later stage.

Method of Delivery: Face-to-face lessons covering a period of two weeks. Links to the written course material will be provided at a later stage.

Final Examination: Mainly written questions on each learning unit. Exact modalities to be determined.

WORKSHOP CONTENT

The goal of this workshop is to apply and compare different proliferation resistance methodologies in a case study of a nuclear installation.

The characteristics of the installation taken as case study is presented at the start of the workshop. Then, the principles of several proliferation resistance methodologies are introduced and realistic examples are shown. After the introduction of each methodology a table-top exercise is prepared to give the possibility to the participants to apply directly the methodology.

Large sections of the workshop are dedicated to the application of the different methodologies to the specific case study and discussion of the results among the participants. A comparison of the methodologies is foreseen at the closing of the workshop.

REQUESTED BACKGROUND

This workshop is intended for professionals that are involved in nuclear safeguards tasks in their organization. Knowledge of nuclear safeguards is required to attend the workshop. The principles needed to apply each proliferation resistance methodology are presented before the table-top exercise.

APPLY HERE

In order to apply for this course, please use the application form on the ENEN website here: <http://www.enen.eu/en/projects/annette/annette-project-courses1.html>
Please enter **Workshop on "Proliferation Resistance Methodologies for Nuclear Installations"** as the course name and **ESARDA** as the course provider.

COURSE FEE

The course is offered as part of the ANNETTE-project and there is no course fee for the participant. However, participants will need to pay for travel, accommodation and meals.

CONTACT

For questions and further information, please contact:

Riccardo Rossa

Scientific collaborator Nuclear Science and Technology Studies at SCK•CEN

Email: riccardo.rossa@sckcen.be

**Regulation and its
Application in Nuclear
Projects**

**Framatome (Karlstein,
close to Frankfurt),
Germany**

POSTPONED to

**February 11th and
12th, 2019**



FUSENET

The European Fusion Education Network

framatome

Course Outline

The course is directed towards engineers that are employed by the ITER Organization, Fusion for Energy, or their sub-contractors in the ITER project (down to the lowest level, i.e. in the supply chain), or in any other supply chain company active in fission new build projects. Preferably they should be active in ITER (or any other fission/fusion new build) related design, procurement, manufacturing, construction, assembly, and commissioning of ITER (or fission/fusion new build) equipment.




The course will impart specific knowledge on nuclear licensing and the impact of licensing requirements on the design as well as on subsequent down-stream activities. Furthermore, it will be complemented by additionally training the skills that are necessary in the nuclear environment of a fission or fusion project like ITER.

Course Content

The training contains the following:

1. Introduction to and overview of national / international nuclear law(s) and related regulation, involved national and international organizations (e.g. ASN, IAEA),

	<p>2. Main licensing activities / deliverables / responsibilities, 3. Overview of Codes and Standards (C&S) and introduction to relevant C&S, their impact on regulation or licensing, 4. Introduction to and overview of nuclear risks, safety objectives, and derived requirements, 5. Basic safety principles: management / technology / process oriented (e.g. defense in depth), 6. Introduction to (deterministic and probabilistic) safety analysis and related tools used by different technical disciplines for simulations in support of licensing, 7. How to integrate nuclear regulation requirements into fusion projects, and perform requirements management, 8. How to apply nuclear regulation requirements in design/manufacturing/construction/assembly/commissioning activities.</p> <p>REQUESTED BACKGROUND The targeted trainees should have undergone a suitable technical engineering education, preferably in a technical subject matter important for their actual job position. They shall be able to understand the basic design of a power plant and its systems and components, and the technical basics (physics/chemistry resp. design/operation) of a nuclear (fission or fusion) reactor.</p> <p>APPLY HERE In order to apply for this course, please enroll at the ANNETTE application page and then contact: Goerge Baltin, Email: goerge.baltin1@framatome.com</p> <p>COURSE FEE The course is offered as part of the ANNETTE-project and there is no course fee for the participant. However, participants will need to pay for travel, accommodation and meals.</p> <p>CONTACT For questions and further information, please contact: Goerge Baltin Course Manager at Framatome Training Center Germany Email: goerge.baltin1@framatome.com</p>
<p>THE FULL CALENDAR OF BNEN COURSES HAS BEEN PUBLISHED: SPEED UP TO RESERVE!</p>	<div data-bbox="496 1108 1078 1211">  Belgian Nuclear higher Education Network </div> <div data-bbox="496 1227 1264 1301">  </div> <p>THE BELGIAN NUCLEAR EDUCATION NETWORK BNEN Courses: the full available programme proposed for ANNETTE in a modular fashion (ACADEMIC CALENDAR)</p> <p>Safety of nuclear power plants (5 ECTS) (11-22 February 2019) Advanced nuclear reactor physics and technology (3 ECTS) (11-15 March 2019) Advanced nuclear materials (3 ECTS) (18-22 March 2019) Advanced courses of the nuclear fuel cycle (3 ECTS) (25-29 March 2019) Nuclear and radiological risk governance (3 ECTS) (1-5 April 2019)</p>
<p>STILL COLLECTING APPLICATIONS FOR FPS@KIT SCHOOL</p>	<div data-bbox="533 1630 912 1818">  </div> <p><i>COURSES OFFERED BY THE FRAMATOME PROFESSIONAL SCHOOL (FPS) AT KIT FOR ANNETTE</i></p> <ul style="list-style-type: none"> ▪ Reactor Exercises (spring 2019) ▪ Design Basis Accidents for Light Water Reactors and Numerical Simulation Tools (April 2019) ▪ Design of Pipelines against Earthquake Loads (on demand) <p><i>AN EXTENDED OFFER BY FPS@KIT FOR ANNETTE (TENS OF PLACES)</i></p> <ul style="list-style-type: none"> ▪ Reactor physics calculations with deterministic methods (link);

	<ul style="list-style-type: none"> ▪ Beyond-design accidents, core-melt accidents (link); ▪ Thermohydraulic Stability Analysis (link); ▪ Radiolytic Gas Management in Boiling Water Reactors (link); ▪ Stress Analysis (link); ▪ Light Water Reactor (LWR) core design and fuel management (link); ▪ Light Water Reactor (LWR) core feedback and transient response (link). <p>For a general description of course conditions, look at this link</p>
<p>CEA-INSTN COURSES WITH NEW DATES</p>	<div data-bbox="493 396 869 566">  </div> <p>Courses by CEA INSTN (FREE of CHARGE FOR ANNETTE)</p> <ul style="list-style-type: none"> ▪ Thermal Hydraulics and safety (14-18 January 2019) ▪ Materials for Nuclear Reactors (21-25 January 2019) ▪ Reactor core physics: Deterministic and Monte Carlo methods (21-25 January 2019) ▪ Nuclear fuels for light water reactors and fast reactors (28 January - 1 February 2019) ▪ Neutronics for light water reactors (11-15 March 2019 and 18-22 March 2019) Click here for the Learning Outcomes
<p>INFORMATION ON RECENTLY ADVERTISED COURSES</p>	<div data-bbox="847 920 1118 1043">  </div> <p>REMINDERS</p>
<p>Principles of Radiation Protection. International Framework. Regulatory Control (e-learning)</p>	<div data-bbox="515 1189 662 1308">  </div> <p>Lecturers: Mrs. Gabriela Rosca-Fartat Mr. Gabriel Stanescu, PhD "Horia Hulubei" National Institute for Physics and Nuclear Engineering (IFIN – HH) Nuclear Training Centre 30 Reactorului, RO-077125, Bucharest-Magurele, Romania</p> <p>Method of Delivery: Asynchronous e-learning. Final Examination: multiple-choice test</p> <p>In order to apply for this course, please use the application form on the ENEN website: ANNETTE application page</p> <div data-bbox="810 1700 1153 1919">  </div>

**SINGLE AND TWO-PHASE
THERMAL-HYDRAULICS -
for nuclear applications**

(e-learning)

**MASSIVE OPEN ONLINE
COURSE ON NUCLEAR
SAFETY CULTURE**

By TECNATOM and UNED



SINGLE AND TWO-PHASE THERMAL-HYDRAULICS

The theoretical lectures and exercise material are already posted. Videos fully available. Contact: walter.ambrosini@unipi.it



MOOC (Massive Open Online Course):

Introducing safety culture and its application to the nuclear field

A completely online, free, international course. General information about the MOOC is available in the link above.

30 h of participant work – 1 ECTS

Divided in 4 independent NOOCs (Nano Open Online Courses):

NOOC I. What is safety culture?

NOOC II. Understanding Nuclear Safety Culture

NOOC III. Developing leadership for safety

NOOC IV. Refreshing Nuclear Basics

Open now the free registration, by clicking on each NOOC above.

Provisional starting date: February 4th 2019, we are actually in the production process!

If you want to receive information about the MOOC/NOOCs, please fill the form [here](#)

We highly thank those advertising this initiative within the nuclear sector, but as well towards professionals from other industries (specially high-risk industries), as well as master students of nuclear and other technical studies, to gather a varied audience to enhance global networking and a collaborative learning experience. This course will allow a research study and its dissemination is crucial to achieve massive participation from the main target groups.



DISSEMINATION ACTIVITIES

**Presenting the MOOC
course for ANETTE
project in the
international congress
“Learning with MOOCs
2018” (LWMOOCs V)**

UNED has presented the MOOC course for ANETTE project “Introducing safety culture and its application to the nuclear field” in the international congress “[Learning with MOOCs 2018](#)” (LWMOOCs V), celebrated in Madrid 26th-28th September in UNED.

Innovative social approach in the nuclear sector: a MOOC in Nuclear Safety Culture within H2020 ANETTE project

Mercedes Alonso-Ramos¹, Ángeles Sánchez-Elvira¹, Javier Sanz Gozalo¹, David Abarca Ahijado², Álvaro Pablo Muñoz Rodrigo², Fernando González González², Tiberio Feliz Murias¹, Manuel Alonso Castro Gil¹

¹UNED, Spain; ²Tecnatom, Spain

The audience talked about the big expectation on what a MOOC of this type in the nuclear sector could attain regarding specially the collaborative learning environment and the interaction between very different target groups: the nuclear sector professionals as well as master students and professionals from other industries.

**INOOC in EADTU
OOFHEC 2018 in
Aarhus presenting our
MOOC within the
Horizon 2020
ANETTE project**

UNED has participated in “[The Online, Open and Flexible Higher Education Conference](#)” – [OOFHEC2018. Blended and online Learning: Changing the Educational Landscape](#), organized by the [EADTU](#) (European Association of Distance Teaching Universities). The conference was hosted by Aarhus University, Denmark.

In the Conference, our work in the field of nuclear E&T innovation was presented, and more specifically our current development of the MOOC on Nuclear Safety Culture within [ANETTE project](#) in collaboration with [TECNATOM](#).

Fostering innovation in the nuclear ET sector through e-learning and MOOCs within the Horizon 2020 ANETTE project

Alonso Ramos, M., Sánchez-Elvira Paniagua, A., Sanz Gozalo, J., Abarca Ahijado, D., González González, F., Feliz Murias, T. & Castro Alonso, M.

UNED has played an important role in the introduction of eLearning to guide the innovation in the project. Our commitment to the project is centred in the MOOC "Introducing Nuclear Safety and its application to the nuclear field". Nuclear Safety Culture (NSC) is a multidisciplinary discipline, the first driver for all nuclear organizations, and a must when teaching on any subject in the nuclear field. The MOOC, built on the expertise in NSC of the engineering company Tecnatom, and guided by the know-how of UNED in open, online learning and MOOCs, is then part of an innovative offer for advanced education, contributing as well to a horizontal communication between stakeholders in the nuclear sector. Also, the possibility to be followed by anyone anywhere opens the scope of the participants to professionals from other industrial sectors, and to talented young students or professionals. Considering the number of people retiring and the difficulties to attract talent to the nuclear sector this networking activity becomes one of the strategic objectives of the MOOC.

HAPPY NEW YEAR 2019!!!



**European Nuclear
Education Network
Association**



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E-mail: secretariat@enen.eu

GENERAL INFO:

Web page of ANNETTE Courses

<http://www.enen.eu/en/projects/annette/annette-project-courses1.html>

Web page for course application:

<http://www.enen.eu/en/projects/annette/eoi1.html>



LINK TO COURSE LIST



LINK TO THE APPLICATION FORM

Web page concerning the grants of the ENEN+ project

<https://plus.enen.eu/grants/>