

Advanced technologies for the nuclear industry

Electrical Engineering Description The master's program "Advanced technologies for the nuclear industry" (ATNI) has as its general objective the specialization of students at a high scientific and technological level, by training skills in accordance with the current requirements of employers from the energetic industry. Relevance for the labor market Master's students and graduates of the master's program work within prestigious companies in the country and abroad, which have certain connections and responsibilities in the field of power electronics and electric drive systems, such as: Nuclearelectrica SA, Expleo Group, Schneider Electric România SRL, Siemens SRL, NXP Semiconductors, Thales Group, Eaton Electric SRL, Continental AG, SEGULA Technologies Group, ICPE S.A. Competences obtained Solving specific research-design problems in the field of nuclear industry, by using dedicated professional software and hardware; Understanding the specific concepts of systems engineering with application to the energetic industry.

The main supporter of the program is Nuclearelectrica SA.

Integrated Vehicle Electrical Systems Engineering is a master's degree program involving the multidisciplinary integration of vehicle systems engineering derived from energy, electrical, electronic, communication and mechanical systems. You will acquire skills in vehicle-specific electrical systems engineering with practical applications in the fields of electrical, mechanical, electronic, communications, materials, advanced control and system modeling.

We have strategic partners of the master of nuclear industry and key players at the forefront of nuclear research and development such as Nuclearelectrica SA and other partners – Academic Initiative. Dâmbovița County is also involved as a main partner of the future nuclear research in its sustainable land projects and activities. This high level of involvement with industry through master courses, scientific events, consultancy and research makes our graduates one of the most desirable in Romania for company recruitment.

The master's program in Advanced technologies for the nuclear industry benefits from special support from public institutions, as well as from key players in research and development in the industry.

The mission of the international master's program - Advanced technologies for the nuclear industry is to promote education and scientific research according to the demands of integration in the knowledge society, regarding the consolidation and development of the European Education Area and the European Scientific Research Area by promoting the great values at the level of all ongoing activities and processes.

This course is designed for students with a solid undergraduate degree in Engineering, Mathematics or Applied Science who wish to gain a skill set that

combines energy, electricity, electronics, communication, mechanics, digital control systems and physical system modelling, all through perspective of modern systems engineering.

General objectives of the study program:

- Creation of a pole of higher education and research in the field of energetic and electrical engineering.
- Training in specialized human resources for professional activities in the field, with research skills for doctoral studies.
- Adapting the offer of courses in the master's program and the scientific content of the disciplines to the needs of national and international industry.
- Modernization of professional and professional activities and their correlation with those in the international field of higher education and research.
- Ensuring the necessary conditions to participate in international training and research networks and programs in the field.

The specific objectives of the study program:

- The ability to develop studies, reports and synthesis of documentation, respectively technical-economic about technologies for the nuclear industry.
- The ability to solve specific problems in the field of Advanced technologies for the nuclear industry by integrating, associating and synthesizing acquired knowledge.
- Knowledge of the elements (notions, principles, concepts, methods, components, systems, equipment, installations, regulations, policies) specific to the field of energetic and electrical systems.
- The ability to efficiently exploit existing resources within certain deadlines imposed to solve tasks, even in new situations.
- Ability to adapt and be self-taught in new techniques, technologies and concepts.
- Build managerial engineering capabilities to initiate, plan, execute and control vehicle electrical integration projects.
- Knowledge of the basic concepts of the operation of European financial instruments.

1. Admission Requirements:

Prerequisites:

- Graduates with a bachelor's degree from a bachelor's degree course or graduates with an equivalent degree from a long-term university course may apply for admission to the master's degree course.
- Citizens of Member States of the European Union, of countries belonging to the European Economic Area and of the Swiss Confederation may also apply for admission to the master's degree cycle, under the same conditions provided by law for Romanian citizens.

- The recognition of studies completed outside Romania will be carried out by the specialized directorate of the Ministry of Education and Research, before the registration of candidates to the entrance exam, each candidate having the obligation to present, at the time of registration to the exam, the certificate of recognition of studies.
- For admission to undergraduate studies taught in Romanian, foreign citizens must provide proof of knowledge of Romanian.

Entrance Exams:

- Admission to the Master's programmes, both for free and fee-based studies, is strictly in descending order of the admission averages obtained by the candidates, within the limit of the places for which the admission competition is organised.
- For Master's degree studies organised in a foreign language, admission will contain a compulsory language proficiency test, which is eliminatory.

2. Degree Levels:

- Master's Degree: 2-year program following a bachelor's degree.

3. Curriculum:

• **Core Courses:**

Mandatory courses that all students in the program must take:

- Development and Management of Object-Oriented Software Projects;
- Systems Engineering Management;
- Electromagnetic Compatibility in Distributed Systems;
- Interconnecting Devices and Interfaces;
- Sensors and Transducers;
- Numerical Simulation of Embedded Systems;
- Modelling, Simulation, Programming and Testing of Integrated Electromechanical Systems;
- Materials, Specific Technologies and Vehicles Environmental Impact;
- Integrated Data Acquisition Systems;
- Risk Management in Electrical Power Systems;
- Diagnosis of electric machines;
- Data acquisition and control system for vehicles;
- Neural algorithms for shape recognition;
- Distributed Electricity Production;
- Smart Grid Technologies;
- Modeling and simulation of integrated micro-systems.

• **Electives:**

- Modernisation of Electricity Systems.
- Advanced Electric Shareholder Management.

- Intelligent Switching Equipment.
- Computer-Aided Design of Electrical Installations.

• **Major/Concentration:**

- Analysis of methods for assessing, analysing and optimising the reliability of electrotechnical and energetic equipment, the design and operation of electrical and power installations, the use of complex electrical equipment and systems, their design, manufacturing technology and installation.

• **General Education Requirements:**

- Successful completion of the mandatory courses, seminars and labs, completion of the three internships and the dissertation thesis.

4. **Credits:**

- Each semester carries a weight of 30 ECTS, with a total of 120 ECTS required for graduation.

5. **Internships and Practical Experience:**

- Professional practice and research are present in all 4 semesters and is credited with 40 ECTS.
- Students could carry out their internship in our partner companies and enterprises in Dâmbovița County and its surroundings, as well as in the teaching and research laboratories of the faculty or the Institute for Scientific and Multidisciplinary Research.
- Scholarships; Erasmus scholarships for study and research internships abroad; Participation in seminars, symposia, conferences; Ethics and academic integrity; Psycho-pedagogical training - level 2 (optional); Continuing studies to become a Doctor of Engineering. Teaching language – English

6. **Research Requirements:**

- In the last semester, students carry out research internships as well as research for the completion of their dissertation.

7. **Academic Advising:**

- A supervising teacher is assigned to each year of study and partially assisted activities are coordinated by supervising teachers.
- The semester-long professional practice activity is carried out under the supervision of two coordinating teachers.
- The dissertation thesis is also supervised by a scientific supervisor.

8. **Extracurricular Activities:**

- Students have the option to participate in clubs, organizations, or extracurricular activities related to their field of study or personal interests.

9. **Examinations:**

- The courses will span 14 weeks during each semester and conclude with oral, written, or practical examinations. Successful completion of these exams is mandatory to earn study credits.

10. Thesis Defense:

The prerequisites for presenting a dissertation thesis before a committee include:

- Attainment of 120 ECTS credits throughout the program.
- Obtaining the approval of the scientific supervisor to present the dissertation thesis.

11. Graduation Requirements:

- Graduation necessitates the fulfilment of all program requirements, encompassing the completion of the required credit hours and the successful completion of the dissertation thesis.

12. Degree Awarding:

- Master's Degree.