



SMART SYSTEM ENGINEERING (SSE)



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PROGRAM'S GOALS

The “Smart Systems Engineering” program provides instruction based on cutting-edge pedagogy to help students gain new skills. This program equips graduates with agile and adaptable abilities in new technologies such as IoT, Industry 4.0, AI, robots, and so on. Besides, two options are offered by the program: the first is focused on Industry 4.0 and IoT, while the second is co-developed with industrial partners and focuses on autonomous systems, particularly automobiles (alternating with STELLANIS), avionics (BOEING), and medical devices (IRC-FLS). Graduates will be able to process, evaluate, and generate smart solutions in a variety of industries, including industry, smart cities, smart buildings, smart agriculture, etc.

This training incorporates innovation at several levels:

- **Training design:** The SSE program is developed from the top down to match the emerging job market needs. It is primarily based on a competency-based approach that employs worldwide benchmarks.
- **Pedagogical approaches:** The SSE program's program employs active methods in its pedagogical operation. Skills development for first and second year students is mostly centered on flipped courses and hybrid teaching. In contrast, in the previous year, the abilities to be imparted to pupils were gained through the «project-based learning» approach. As a result, the DEFIS space supports the program (ENSIAS FabLab).
- **Teaching methods:** The SSE stream program can be delivered in-person, remotely, or hybridly, using MOOCs, video clips, and reference books.
- **Languages of instruction:** The first and second years of the SSE program are taught in French or English, while the third year is taught in English. In the second year, students are given an introduction to the Asian language.
- **Certifications:** The SSE program provides students with a variety of certifications from our partners, including CISCO, IBM, NI, and others.
- **International mobility:** The medium-term vision is to switch completely to English in order to be able to travel from and to the south (English or French-speaking) and from and to Asian, American and European countries.

ACCESS CONDITIONS

- Candidates who have completed the two-year INP cycle preparation for engineers
- Candidates who have passed the national common admissions exam for engineering training institutions and affiliated institutions
- DEUG (Bachelor's degree first cycle) : Mathematical Sciences (SM) or Computer and Mathematical Sciences (SMI), Competition-based Access
- Bachelor's degree in Applied Mathematical Sciences (SMA) or SMI, Degree-based Access
- Bachelor's degree in Sciences & Techniques, Degree-based Access

TRAINING'S OPPORTUNITIES AND BENEFITS

The SSE program focuses on new professions that demand agility, flexibility, and a strong capacity to tackle the increasingly complex issues that business faces. ENSIAS 4.0 SSE engineers can thus work in the following fields:

- Engineers in robotics/cobotics
- Industrial computer engineer
- Digital simulation/XR (Extended Reality)/DT (Digital Twin) engineer
- IoT developer engineer
- Industry 4.0 architect
- Industrial Big Data expert (industrial Data Scientist)

SIGNIFICANT LEARNING ABILITIES

After completing this program, students should be able to:

- Be aware of and comprehend the increased needs for competitiveness that an industrial firm faces in a worldwide economic climate, with a special emphasis on the technological innovation process management.
- Understand and use new Industry 4.0 standards and architectures to deal with the confluence of the worlds of operations and information technology.
- Understand and implement breakthroughs in the field of industrial robotics, particularly collaborative robotics and its use in manufacturing processes.
- Recall the terminology and key elements of the digital transformation to intelligent systems and Industry 4.0.
- Gain an understanding of the fundamental technological components of intelligent systems and Industry 4.0.
- Use methodologies and tools to harvest data for intelligent systems and Industry 4.0.
- Examine the economic, societal, organizational, and technological implications of intelligent systems and Industry 4.0.
- Assess the usefulness of intelligent systems and Industry 4.0 scenarios and elements to a business.
- Develop original solutions for many facets of intelligent systems and industry 4.0.

MODULES PER SEMESTER

