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## Electrical Engineering SP

### Labour needs

1. In-depth knowledge and understanding of the sciences and techniques related to electronic, production, treatment and use of electrical energy, automatic and industrial automated systems.
2. Skills in the field of emerging technologies in electrical engineering
3. Skills in the modeling and simulation in the field of electronic or electrotechnic or automated systems
4. Skills in the control of automated production facilities and the development of operating modes and manufacturing or industrialization processes
5. Skills in the fields of electrical engineering and in the implementation of systems for production, transporting, converting and optimizing electrical energy.
6. Skills in analyze, design and implementation of circuits using electronic and microelectronic components and their associated topologies.
7. Analytical and problem solving skills
8. Skills in the management of industrial projects and multidisciplinary work team
9. Skills in continuously updating knowledge
10. Good reading/writing skills in English and French
11. Communication skills

### Program aims :

The main objectives of the Electrical Engineering program are:

- Prepare graduates with strong background in the field of electrical engineering able to combine theory and practice using new technologies to identify analyze, design and implement reliable solutions (software or hardware) to problems engineering in the fields of electronics, electrotechnics, automatic and industrial computing. In particular specific reference to the following disciplines are given such : embedded systems, real-time systems, systems for producing and operating electrical energy, Control of electrical machines, control and supervision of automated systems, advanced automatic control approaches,
- Give students the necessary tools in soft skills - in terms of economics concepts, project management techniques, mastery of languages and communication skills, teamwork, decision making skills, respect of ethical safety and environmental factors,

By ensuring these skills, we aim that:

- Graduates will integrate a company or launch their own start-ups related to Electrical Engineering
- Graduates will demonstrate growth in careers related to Electrical Engineering and become productive engineers.
- Some graduates will pursue research studies.
- Graduates will engage in professional development activities to adapt to evolving technical challenges and career opportunities.

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The main areas in which graduates can find employment and level of responsibility they are qualified to take can be identified as follows:

- industrial companies (Testing and Manufacturing, aeronautics, chemistry, electronics, food, automobile, shipbuilding, electricity, household appliances, energy, fluid, railway, paper industry, mechanism, metalworking, petrochemistry, Plastics, ...)
- public companies / public institutions
- research and development organizations
- engineering and design offices

### Program learning outcomes

1. Demonstrate In-depth knowledge of the fundamentals basic of mathematics and sciences essential to identify, formulate, and solve physical phenomena related to electrical engineering
2. Demonstrate understanding of the sciences and techniques of electrical engineering define, describe and design electrical systems or component (especially in the field of electronic or electrical machines electrotechnical or automatic and industrial automation systems)
3. Demonstrate critical thinking and creativity to use emerging technologies and modern engineering techniques (IOT, fuzzy control, embedded systems, renewable energy, ...).
4. Carry out modeling and simulation to describe electrical phenomena and to propose and establish classical and advanced approaches that meet pre-defined performances in the field of electronic, electrotechnical or automatic.
5. Define, formulate, analyze, and implement solutions to complex or incompletely defined problems and to existing products or processes.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and synthesize information to draw valid conclusions
7. Apply engineering tools to design products (software and hardware), processes and to produce solutions that meet specified control, command and supervision needs with consideration of non-technical constraints such as societal, ethical and safety, environmental or economic factors.
8. Take complex decisions and formulate judgments based on incomplete or limited information
9. Recognize the international standards and regulations applicable to electrotechnical, electronic systems and industrial automation.
10. Recognize the concepts and principles of economics and management, mobilize the management and entrepreneurship techniques necessary to achieve engineering objectives
11. Ability to work in team
12. Master several languages (3 languages) and ability to communicate according to the audiences (specialists or neophytes) or the context of the exercise of the function (national or international).
13. Engage in lifelong learning, using appropriate learning strategies.

These Program learning outcomes are defined as what a student is expected to know, understand and/or be able to demonstrate after completion of the learning process