Co-op Program

MECHANICAL ENGINEERING
COURSE-BASED MASTER'S

The course-based master's in mechanical engineering prepares students to carry out and implement development projects and practice as a professional engineer to address the specific needs of clients and employers.

WHAT OUR STUDENTS CAN DO FOR YOU

Conception

- Design and modificationof equipment and machines
- Project for the installation of posts of work
- Surveys and drawing
- Feasibility study, estimation, search for suppliers, request and follow-up of submissions
- Design of parts
- Monitoring of manufacturing and installation of equipment

Production and maintenance

- Implementation of systems preventive maintenance
- Sampling, control of quality and metrology
- Study and resolution of production problems
- Development of procedures
- Time and movement study
- Staff training
- Floor supervision

Research and development

- Assemblies and test benches
- Trials and acquisition of data
- Interpretation of results

Construction

- Preparation and follow-up during the factory stoppages
- Administrative follow-up: preparation purchase orders, etc.
- Inspection and tests
- Project management (MS Project)

KNOWLEDGE AND SKILLS

Students complete 30 course credits at the master's level before starting their internship that concludes their program.

Specialization in mechanical engineering - 18 to 36 credits (3 credits per activity)	
General training	Optimization techniques, experimental designs and multivariate analysis, finite element methods, mechanics continuous media, quantum mechanics for engineers (4 credits), numerical calculation methods in engineering, processing and frequency analysis of experimental data, application of finite elements in mechanics, robotics: Modeling and control, advanced control in mechatronics, advanced dynamics
Acoustic and vibrations	Fundamental acoustics, acoustic radiation of structures, active noise and vibration control, aeroacoustics, digital methods in noise and vibration control
Aeronautics	Introduction to aeronautics, aircraft propulsion, flight mechanics, aircraft aerodynamics, aerodynamics and performance of helicopters, hydromechanics and application in aeronautics, structures of planes, aerospace structures: experimental study
Bioengineering	Design in bioengineering, biomechanics of movement, case analysis in bioengineering, imaging medical: Treatment and modeling
Design and great quality	Advanced mechanical design, quality engineering case studies
Materials	Materials characterization techniques, polymer engineering, material degradation, materials composites, behavior, optimization and failure of composite structures
Micro-engineering, microfabrication and microsystems electromechanical	Nanocharacterization of semiconductors (1 credit), genesis and characterization of thin films (2 credits), introduction to microelectromechanical systems (1 credit), micro-engineering of MEMS (2 credits), thermal and mechanical integration of microfabricated structures
Thermofluid	Turbulence: experimentation and modeling, advanced thermodynamics, advanced heat transmission, complementary to fluid mechanics, experimental aerothermal, refrigeration and revalorization of heat, introduction to turbomachinery, introduction to computational fluid dynamics, combustion and gas dynamics
Project management of engineering	Financial analysis in engineering, creativity and problem solving, management of engineering projects: process, engineering project management: control and monitoring, manage one's career in engineering, courses of preparation for the CAPM®exam, managing product development, six sigma and Zero Waste, negotiation and management of disputes in engineering, effective communication in engineering

ORGANIZATION OF STUDY (S) AND WORK TERM (W)

1st year			2nd year
FALL	WIN	SUM	FALL
S-1	S-2	S-3 OR W-1	S-3 OR W-1