People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

Sétif 1 University – Ferhat Abbas

Faculty: Sciences

Master's Degree in Optimization and Control

Presentation and objective of the Speciality:

- Optimization is a branch of mathematics seeking to model, analyze and analytically or numerical solve problems that consist of minimizing or maximizing a function on a given set. Many systems that can be described by a mathematical model are optimized. The quality of the results and predictions depends on the relevance of the model, the good choice of variables that we seek to optimize, the efficiency of the algorithm.
- The optimization and control master inforces the fondamental knowlegdge of optimization.
- Development of adequate methods for solving many important problems in conic programming which include the linear, convex quadratic programming, semidefinite programs and other important subjects.

Admission requirements:

- Successful completion of the three level years in License (Bachelor's degree) in mathematics .

Career Prospects/Professions:

- This training is intended for teaching and researching professions, in university environement

Organization of Studies and Official Duration of the Program:

Program Overview:

Semester 1:

- Simplicial Methods
- Convex Analysis
- Matrix Analysis
- Infeasible Method
- Teaching and Research Techniques (TER 1)
- English

Semester 2:

- Interior Point Methods
- Conic Problem
- Semidefinite Programming
- Teaching and Research Techniques (TER 2)
- Ethics

Semester 3:

- Combinatorial Optimization
- Complementarity Problem
- Variational Inequality Problems
- Control Theory
- Teaching and Research Techniques (TER 3)
- English

Semester 4:

- Internship in a research laboratory or in a company, culminating in a final thesis and defense.

Curriculum Highlights:

The aim of the "Optimization and Control" program, in terms of acquired skills, is to enable students to master the tools and techniques necessary for the analysis, modeling, and optimization of complex systems. In doing so, they become capable of designing and implementing control strategies tailored to the specific requirements of industrial or technological sectors, thereby contributing to the improvement of process performance and reliability.

Training Canvas:

Méthodes simpliciales,
Analyse convexe
Méthode non réalisable
Méthodes de points intérieurs
problème conique
Programmation semi-définie

Advanced training modules:

Optimisation combinatoire
Problème de complémentarité
Problèmes d'inégalité variationnelles
Théorie de contrôle

Language of instruction:

French and English

Training framework:

The tables provided in the previous section "Program Overview"

Admission Information:

The current application of Articles 171 and 1023 of Decrees:

- Skills and knowledge acquisition are assessed every six months through continuous assessment and a final exam.
- Progress from the first to the second year is automatic if the student has completed the first two semesters of the training program.
- The student's assessment focuses on, depending on the training program: lectures, practical work, tutorials, and practical internships.

Coordinator of the Program: Pr. Mohamed Achache

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