Curriculum - Academic Year 2018-19
Characteristics of the Course Units

Name	*Processes optimization*
ECTS credits	*6*
Year / Semester	*III /1°*
Specific learning outcomes	*Having successfully completed this module, student will be able to demonstrate knowledge and understanding of:* *- Demonstrate knowledge and understanding of the basic ideas underlying optimization techniques.* *- Demonstrate knowledge and understanding of some of the most common standard optimization models and how they can be solved, including Simplex methods, gradient methods and Lagrangian function theory.* *- Understanding the basic optimization theory including optimality conditions and duality theory.* *- Participate in class discussions with colleagues and with teachers*
Contents	*1. Introduction to optimization modes including linear and nonlinear models* *2. Graphical method for linear programming with two variables* *3. Simplex methods (Phase I and Phase II methods, Dual simplex method) for linear programming* *4. Duality theory and sensitivity analysis* *5. Theorems of complementarity and the alternatives* *6. Search methods (gradient methods) for nonlinear optimization* *7. Lagrangian function theory 8. Practical use of software in solving linear programming*
Teaching and learning methods	*Face to face, 72 hours*
Teaching techniques	*Lectures, 24 hours* *Practical classes, 48 hours*
Assessment methods	*Written and practical.* *Consulting with lecturer during office hours.* *Consulting with teaching assistant during office hours.* *Private sessions for redelivering the lecture contents.*
Assessment criteria	*In the mid-term test students should demonstrate their ability to:* • *Develop mathematical optimization models for a range of practical problems.* • *Appreciate the power of using the mathematical approach to optimization problems relevant to engineering* *Finally, students' ability to participate in class discussions with teachers and colleagues will be assessed in practical classes.*
Assessment metrics	*Attribution of a final grade*
Criteria of attribution of the final grade	*The final grade will be determined according to the following rules:* *Midterm Evaluation: (30%)* *Final exam: (40%)* *practical classes assessments: (30%)*
Preparatory course units	*N.A.*
Didactic material	*Frederick S. Hillier, Gerald J. Lieberman (2010). Introduction to operations research.*

	Nocedal, J and Wright, S (2006). Numerical Optimization. *Vanderbei, R. (2014). Linear programming: Foundation and Extension.* *Stephen Boyd, Lieven Vandenberghe (2004). Convex optimization.*