Quantitative models and methods in management I

Academic Year: (2020 / 2021) **Review date: 22-06-2020**

Department assigned to the subject: Mechanical Engineering Department

Coordinating teacher: PRIDA ROMERO, BERNARDO

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

THE STUDENTS WHO TAHE THE INDUSTRIAL ORGANIZATION SPECIALITY
IS RECOMENDED START WITH THIS SUBJECT

OBJECTIVES

The student who pass this subject will be reach skills to:
* Study any other subject in "Industrial Organization" speciality
* Ability to apply knowledge of mathematics, statistics, economics and other scientific fields to the analysis of business situations.
* Identify and describe industrial problems in a given enviromenment
* Reconize the supply chain and their life cycle (Design, working, maintenance, replacement and innovation to sustainaibility)and identify the strategic rol of the human resources in the organization.
* Modelize this situations and solve this models with computer tools and sometimes, in simple cases, manually.
* Modelize: Production planning, supply chain managemt, assignment, assignment, transport, location, etc.
* Reconize situations that could be modelized with optimization restricted models (linear programming, dynamic programming, networks).
* Ability of comunication and working in groups

DESCRIPTION OF CONTENTS: PROGRAMME

1 The Enterprise as a sociotechnical system.
  1.1 Eficacy Efficiency and flexibility
  1.2 Productivity
  1.3 Human and techical resources in the enterprise
  1.4 Models in taking decision in management.
  1.5 Types of models
2- Modeling with lineal optimization with constraints models: Exercices:
  2.1 Production planning, supply chain managemt,
  2.2assignment
  2.3 Logistcs management
  2.4 Transportation
3 Solve and analysis of results of models.
  3.1 Advantages and limitations of this models.
  3.2 Cost accounting and cost in decision models
4 Hipotesis in leinear programming
  4.1 Integer, binary, mixed and non linear models
  4.2 Assignment, Location problems
5 Another methods in modeling: Nerworks optimization and heuristics
6 Another methods in modeling: Dynamic programming

LEARNING ACTIVITIES AND METHODOLOGY

Lectures, exercises, practical sessions in laboratory with cases and assignments to the carried out by the students and discussed in the sessions, readinggs assigned by the instructor
The students must assist to sessions of theory and practice and also must take practices with
* Case analysis
* Computer software
* Working in groups
All the activities could be place in live or on line, using the "aula global" tools, depend of the situation.

ASSESSMENT SYSTEM

THE CONTINUOUS ASSESMENT (40%) FINAL EXAM (60%)

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Bazaraa and Jarvis Programación lineal y flujo en redes, Limusa, 1981
- Hillier y Lieberman Investigación de operaciones, Mc Graw Hill, 2001
- Taha, H. Investigacion de Operaciones, Rama omega, 1991

ADDITIONAL BIBLIOGRAPHY

- Russell L. Ackoff Systems thinking for curious managers, Triarchy press limited, 2010