Production and manufacturing systems

Academic Year: (2019 / 2020) **Review date: 18-03-2019**

Department assigned to the subject: Department of Systems Engineering and Automation

Coordinating teacher: RODRIGUEZ URBANO, FRANCISCO JOSE

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 2

COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.

- To know the fundamentals of the production and manufacturing systems and the theoretical basis of the manufacturing processes.
- To acquire the ability to increase this knowledge and apply it to the development of industrial projects related to production and manufacturing processes.

DESCRIPTION OF CONTENTS: PROGRAMME

1.- Introduction.
1.1.- Introduction.
1.2.- Automated machinery.
1.3.- Sensors.
1.4.- Robotized systems.
1.5.- Flexible manufacturing systems.
2.- Materials management.
2.1.- Kanban and JIT.
2.2.- Computer based material planning systems (ERP).
2.3.- Identification systems.
2.4.- Transport elements.
2.5.- Traceability and warehouse management.
3.- Information management.
3.1.- Arquitectures of CIM systems.
3.2.- Industrial communications.
3.3.- SCADA software and flexible manufacturing systems simulation products.
4.- Introduction to manufacturing processes.
4.1.- Forming processes.
4.2.- Machining processes.
4.3.- Surface finishing processes.
4.4.- Element joining processes.
4.5.- Thermal processes.
4.6.- Finishing processes.
5.- Sustainable production.
5.1.- Sustainable development.
5.2.- Environmental impact.
5.3.- Sustainable design.
6.- Manufacturing trends.
6.1.- Product or service.
6.2.- Market scenarios.
6.3.- Knowledge based enterprise.
6.4.- New enterprise logistics and organization.
6.5.- Logistics: direct and inverse logistics.
7.- Production systems case studies.
7.1.- Process plans.
7.2.- Food industry.
7.3.- Automobile industry.
7.4.- Stainless steel production.
8.- Manufacturing systems simulation.
8.1.- Introduction to discrete events software simulation packages.
8.2.- Implementation of a manufacturing systems model on a simulation package.

LEARNING ACTIVITIES AND METHODOLOGY

- Theoretical lectures oriented for the acquisition of theoretical knowledge.
- Classes of problems in small groups for case studies.
- Individual tutorials and students' personal work, aimed at the acquisition of skills related to the subject program.
- Laboratory practices: 4 sessions of 1'5 hours. During the lab sessions students will learn to analyze a production process by means of a simulator. Students submit an assignment that will be marked.

ASSESSMENT SYSTEM

The breakdown of the course final grade is as follows:
- Assignment Work: Work and practice exercise: 40%
- Final Exam: 60%.

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

BASIC BIBLIOGRAPHY

- James A. Regh Computer Integrated Manufacturing (third edition), Prentice Hall, 204
- SINGH, N. Systems Approach to Computer-Integrated Design and Manufacturing., Ed. John Wiley & Sons., 1996.
- Serope Kalpakjian. Manufacturing Engineering And Technology. , Addison-Wesley Pub., 2001.

ADDITIONAL BIBLIOGRAPHY

- REMBOLD, U. Computer-Integrated Manufacturing Technology and Systems. , Marker Dekker., 1985.
- REMBOLD, U., NNAJI, B.O., STORR, A. Computer Integrated Manufacturing and Engineering., Addison-Wesley., 1993.
- SCHEER, A.W. CIM-Toward the Factory of the Future. , Springer Verlag., 1991.