University of Jaén

Master in Industrial Engineering

Higher Engineering College in Jaén
(Spain)

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Introduction

- This education program focuses on areas of Electrical, Electronic and Mechanical Engineering Systems. Applications are related to: energy production, storage, conversion and transportation in the domains such as: embedded systems, grids, smart grids, energy dispatching, processes' automatic control, etc.
- MS IE covers a broad spectrum of subjects and lets students work as a professional workers, researchers even gets their Ph degree and work in the academic world.
- The courses will be taught by high- level academic scientists and engineers in theoretical and practical activities.

Introduction

- The field of industrial engineering brings together the knowledge of different fields concerned with technology: production, planning and control, manufacturing systems and processes, facilities design, safety and quality measurements, reliability and analysis of systems mostly based on computer-aided design and computer-aided manufacturing. In addition, industrial engineers need to do the best in terms of efficient, quality and safety conditions.

The Master in Industrial Engineering is focus on students who are finished their bachelor degree (four whole years) in order to get a higher specialization

Admission Policy

- UJA welcomes each year many foreign students and is used to help them for practical and administrative formalities.

- The Master of IE is offered to all students who finish the bachelor's programs offered by EPSJ (4 years). So, admission in this MS required level of Bachelor of Industrial Electronic, Mechanical, Electrical, Chemical or Textile and Management Industrial Engineering even though, any other degree for a foreign student.

Admission Policy

Master in Industrial Engineering
2 courses-120 credits ECTS

Optional | Optional | Optional | Optional | Optional

ITINERARIES

BACHELOR

Degree in Mechanics Engineering
4 years
240 ECTS

Degree in Electrical Engineering
4 years
240 ECTS

Degree in Industrial Electronic Engineering
4 years
240 ECTS

Degree in Quimical Engineering
4 years
240 ECTS

Degree in Industrial Management Engineering
4 years
240 ECTS

Further courses-48 ECTS

Enrollment fees

- Acceptance to scholarships leads the same regulations established by our International Relation Office.

- **Tuition fees**
  - International exchange students benefit from free tuition at UJA for them who are coming from partner universities.

Course requirements

- The fundamental teachings on electrodynamics, power electronics, real time controls and electrical energy system management include the high scientific level lectures, completed by numerical modeling and experimental verification on several electrical engineering systems.

- MS in Industrial Engineering's program is carried out in **two years** and requires 120 ECTS (60 credits/year), consisting of 78 ECTS of compulsory courses, 30 optional and 12 for MS' thesis (included research requirements).

Course requirements

a.- **Basic requirements and comprehensive courses**: Students must take a specific number of credits depends on their previous bachelor degree.

b. - **Core courses** are classified into three categories:

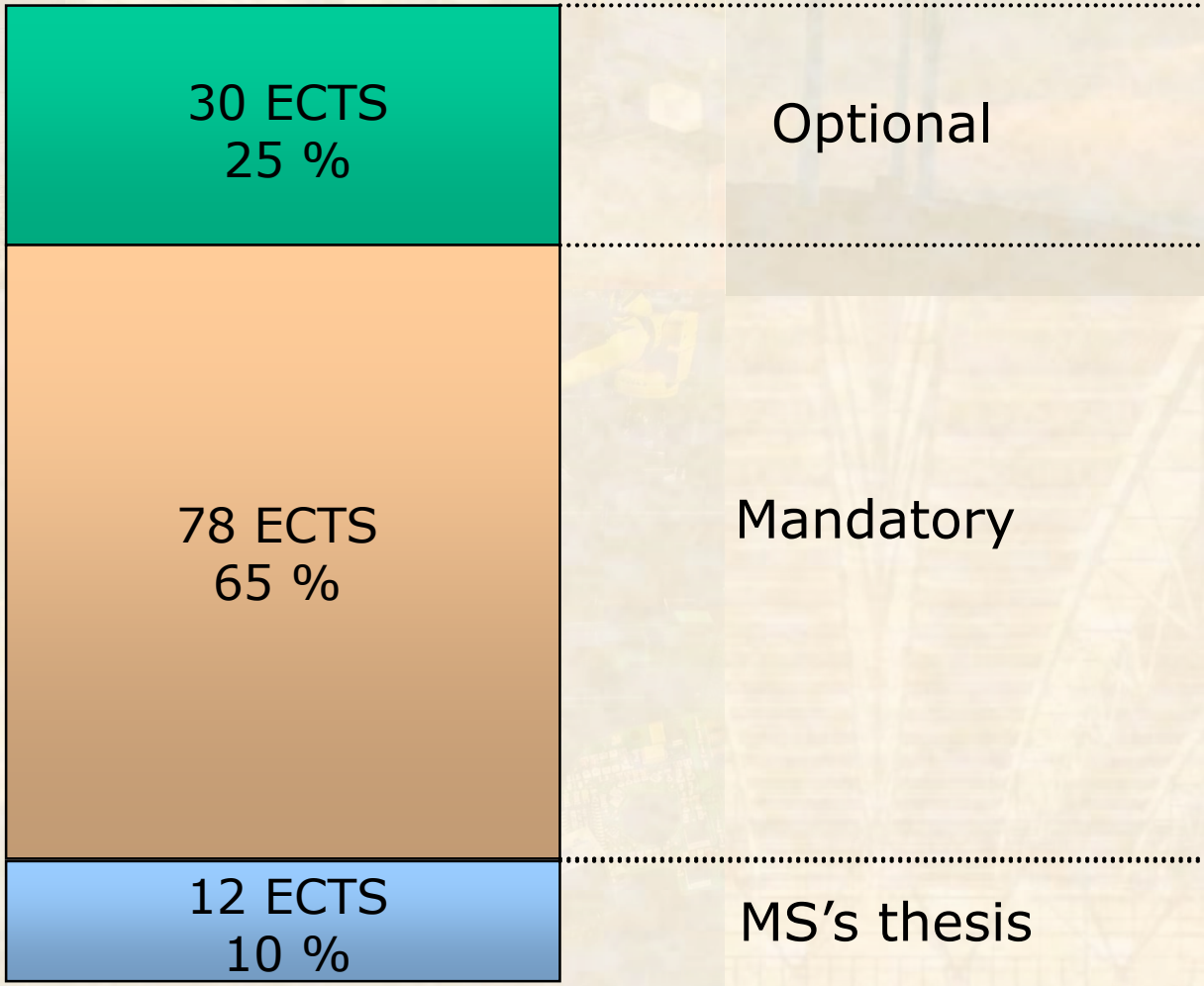
- 40 ECTS of core courses in Industrial technologies.
- 18 ECTS of core courses in Management courses.
- 20 ECTS in Industrial facilities, factories and complementary structures.

c.- 12 ECTS in **MS's thesis**

Course requirements

2 courses

120 ECTS



Course requirements

2 courses

120 ECTS

30 ECTS
25 %

Optional

40 ECTS
33 %

Industrial Technologies

18 ECTS
15 %

Management

20 ECTS
17 %

Industrial facilities, factories and complementary structures

12 ECTS
10 %

MS's thesis

Thesis requirements

- The master thesis must show marked research achievement in one of the departmental concentration areas.
- A professor in the student's area of interest must supervise the thesis requirement
- Methods and techniques of scientific investigation should also be demonstrated.
- Students do not need to wait until completing all course work before beginning thesis research.
- A written proposal with literature review approved by the advisory committee in the preliminary oral examination is required before definitive thesis research is begun.

Calendar

1st course

1st semester

30 ECTS — Optional

2nd semester

30 ECTS — Mandatory

2nd course

1st semester

30 ECTS — Mandatory

2nd semester

18 ECTS — Mandatory

12 ECTS — Final MS' thesis

Syllabus

1st course

1st semester

Thermofluid applied engineering	6
Technical mechanics	6
Electrical Installations	6
Electrical motors and generators	6
Digital and analogic electronics	6
Automatic control and programmed electronics	6
Chemical processes (engineering)	6
Advanced mathematics	6
Advanced computer	6
Internship 1	6
Internship 2	6
Internship 3	6

Optional with training complements

Optional without training complements

2nd semester

Quality management	5
Business management and administration	5
Testing and calculation mechanical machines	5
Chemical technology	5
Automation and control	5
Electronic Systems and Industrial Instrumentation	5

Mandatory

2nd course

1st semester

Integrated systems of manufacturing	5
Integrated systems of production	5
Hydraulic technology	5
Industrial facilities	5
Industrial constructions and structures	5
Management and administration of projects	5

Mandatory

2nd semester

Energy technology	5
Engineering of transport systems	5
Electrical technology	5
Managing human resources and risk prevention	3

Mandatory

Final MS's thesis	12

Final MS' thesis

Syllabus

Complementary courses (depends on your degree)

Subjects	Mechanical Eng.	Electrical Eng.	Indust.electronic Eng.	Chemical Eng.	Textile Eng.	Industrial Management Eng.
Thermofluid applied engineering	X					
Technical mechanics	X					
Electrical Installations		X				
Electrical motors and generators		X				
Digital and analog electronics			X			
Automatic control and programmed electronics			X			
Chemical Process Engineering				X		

Syllabus

Course-Semester

1-1s

- Thermofluids applied engineering (6)
- Technical mechanics (6)
- Electrical Installations (6)
- Electrical motors and generators (6)
- Digital and analogic electronics(6)
- Automatic control and programmed electronics (6)
- Chemical Process Engineering (6)
- Advanced mathematics (6)
- Advanced computer (6)
- Internship 1 (6)
- Internship 2 (6)
- Internship 3 (6)

1-2s

- Testing and calculation mechanical machines (5)
- Quality management (5)
- Business Management and Administration (5)
- Electronic Systems and Industrial Instrumentation (5)
- Automation and control (5)
- Chemical technology (5)

2-1s

- Integrated systems of manufacturing (5)
- Hydraulic technology(5)
- Industrial constructions and structures (5)
- Integrated systems of production (5)
- Industrial Facilities(5)
- Management and administration of projects (5)

Module. INDUSTRIAL TECHNOLOGIES

2-2s

- Energy technology(5)
- Engineering of transport systems (5)
- Managing human resources and risk prevention(3)
- Electrical Technology (5)
- **MS's thesis (12)**

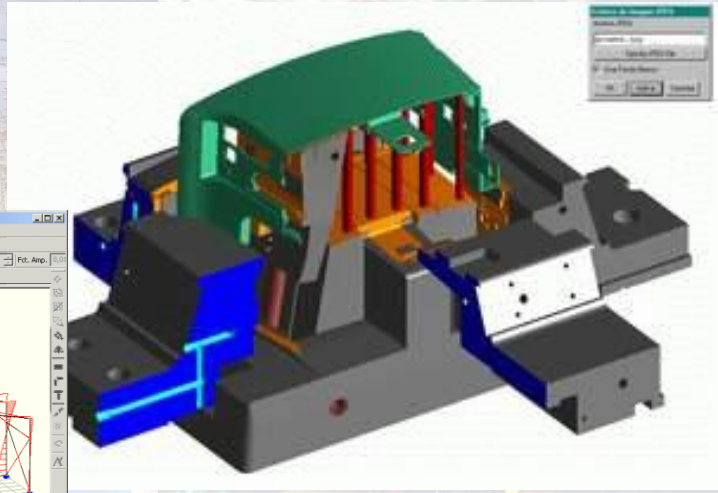
MODULE. INDUSTRIAL FACILITIES, FACTORIES AND COMPLEMENTARY STRUCTURES

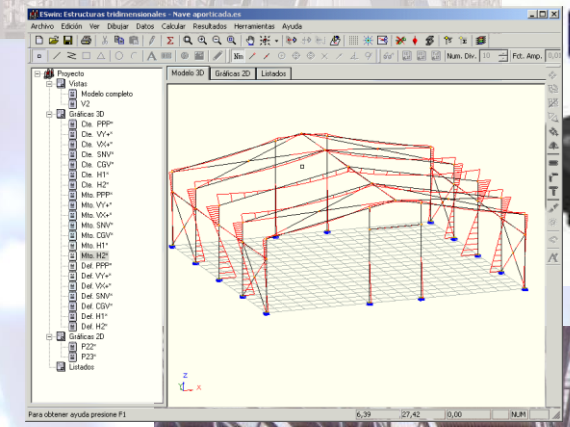
MODULE. MANAGEMENT

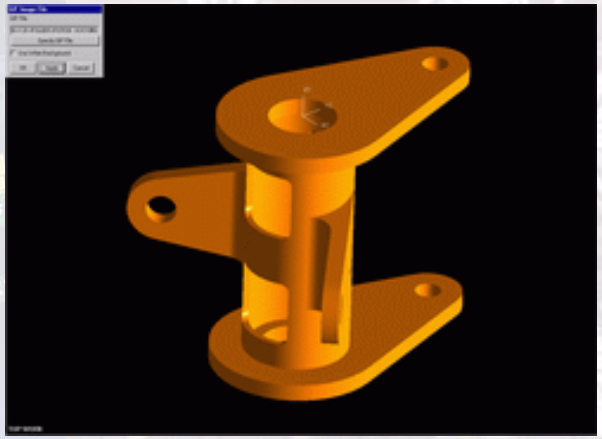
- MODULE INDUSTRIAL TECHNOLOGIES
- MODULE MANAGEMENT
- MODULE INDUSTRIAL FACILITIES, FACTORIES AND COMPLEMENTARY STRUCTURES
- MODULE OPTATIVE SUBJECTS

What about the contents?

Design and construction of mechanical equipment and structures





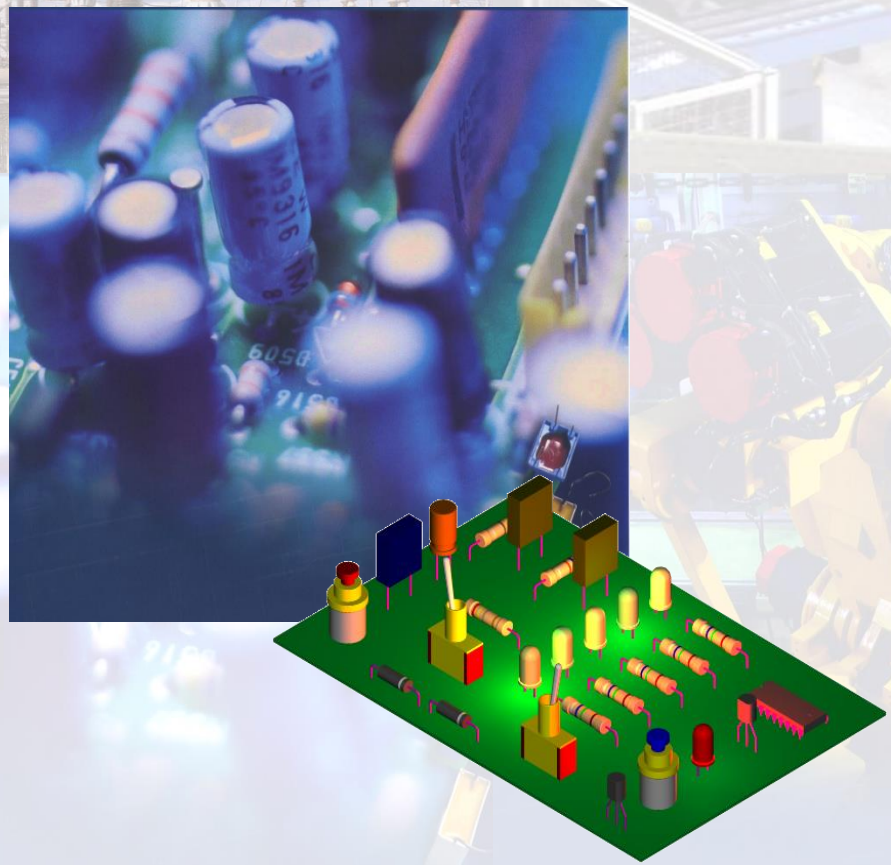


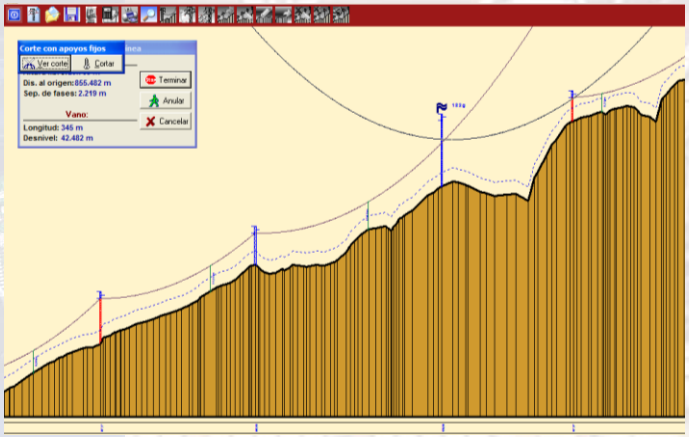
What about the contents?

Design of electronic devices, industrial networks, robots and automatic production systems.

What about the contents?

High and low voltage power systems, electrical network, management of the electrical power system, development of electrotechnical devices, etc.





What about the contents?

Renewable energies such as wind energy , PVGCPSs, solar thermoelectric, biomass power plants, etc.

What about the specializations?

The range is broad for a MS in II

- Quality and Reliability Engineering
- Cost Engineering
- Operations Research and Decision Sciences
- Human Factors/Ergonomics
- Production and Manufacturing Systems
- Service Systems
- Systems Analysis

What about the industrial context?

- Electrical Engineering System Design
- Power Electronics, Electromechanical Conversion
- Real Time System Control
- Electrical System Diagnosis
- System Management
- System Optimization
- Energy Efficiency
- Energy Sources
- Renewable energies
- Energy Storage
- ….

Credit recognition

- If you've undertaken previous studies, you may be eligible for credit recognition (or recognition of prior learning) which acknowledges the skills and knowledge acquired.

1. **Erasmus stayment**
2. **Professional skills**
3. **Some previous courses which appear as recognized subjects**

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