



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

Further
courses-48
ECTS

**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



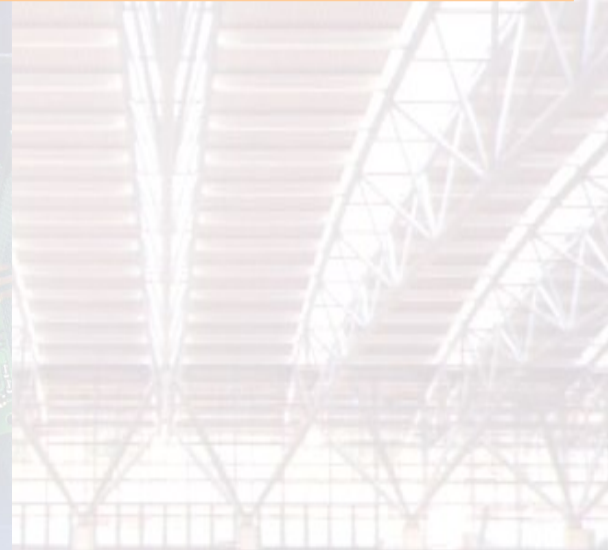
Enrollment fees



❑ 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**

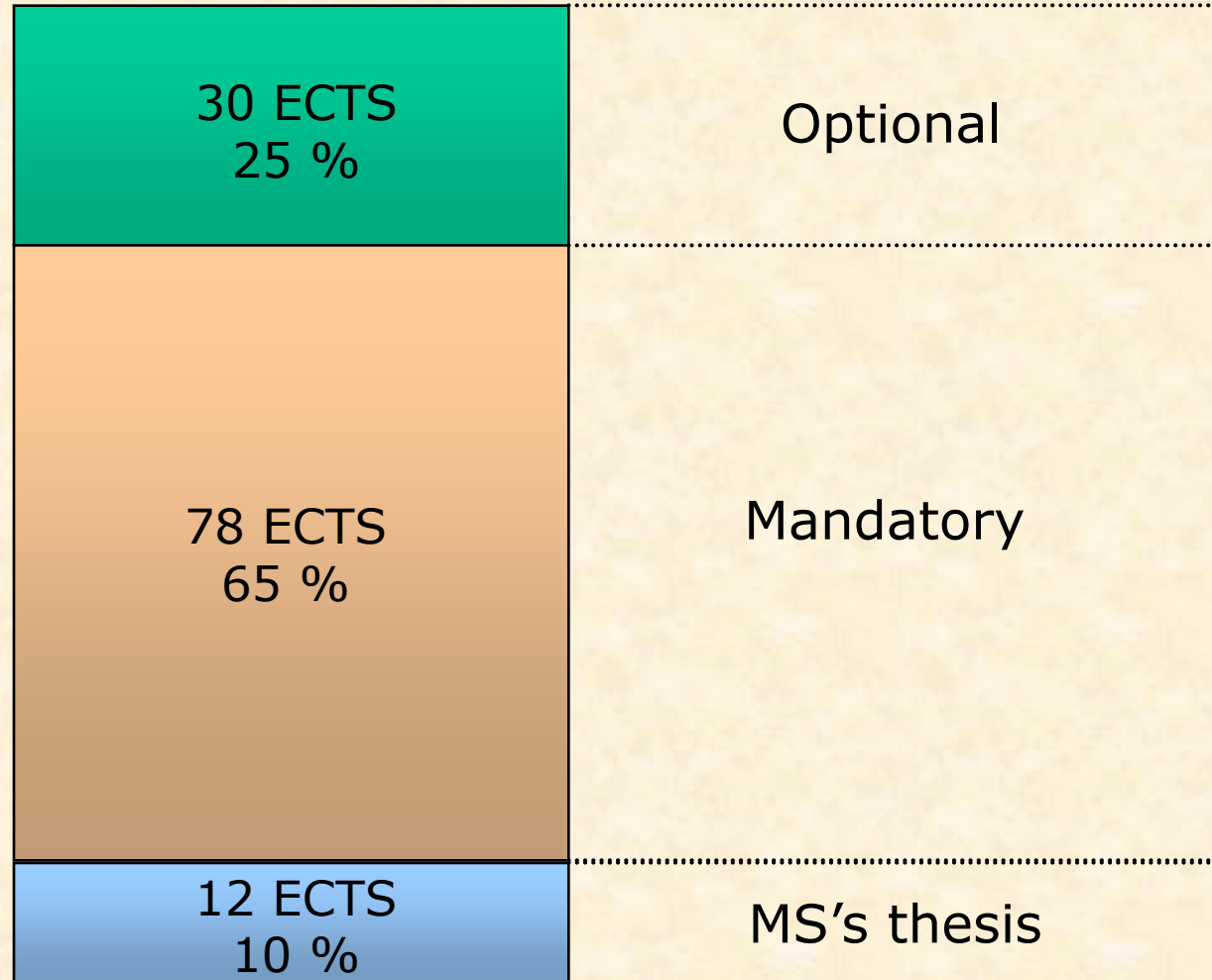


Course requirements



2 courses

120 ECTS



Optional

Mandatory

MS's thesis

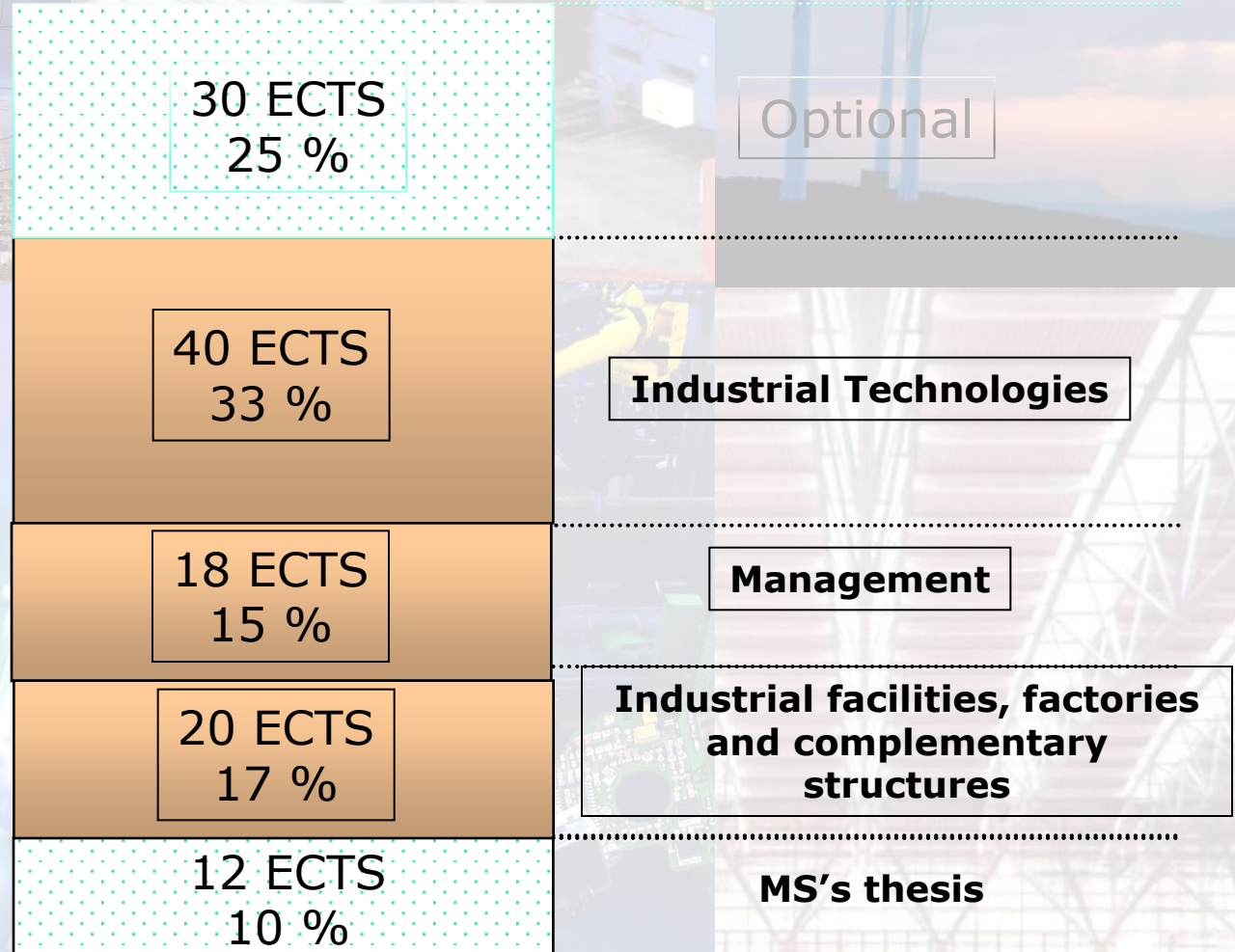


Course requirements



2 courses

120 ECTS





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.

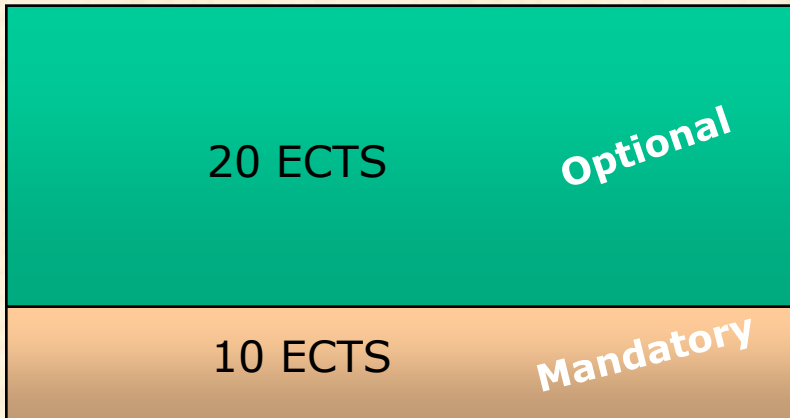


Calendar

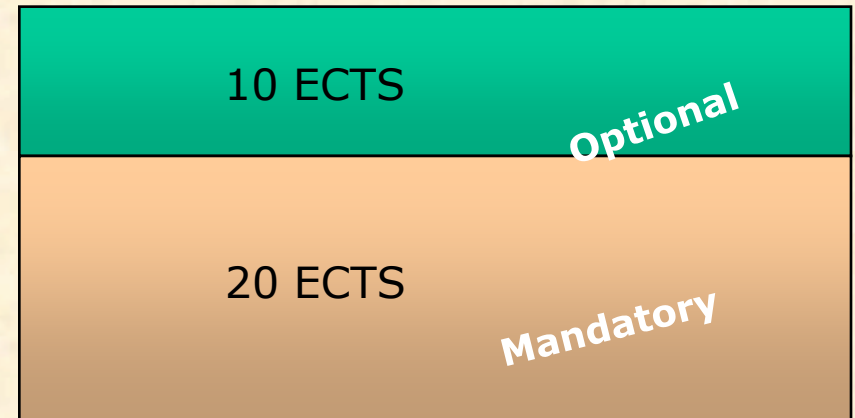


1st course

1st semester



2nd semester

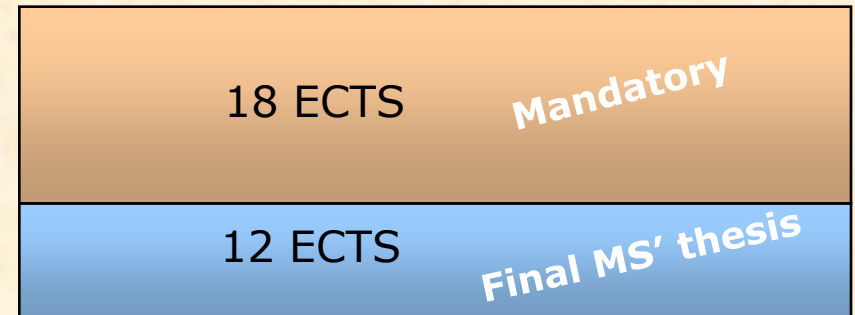


2nd course

1st semester



2nd semester





Syllabus



1st course

1st semester

Thermofluid applied engineering	4
Technical mechanics	4
Electrical Installations	4
Electrical motors and generators	4
Digital and analogic electronics	4
Automatic control and programmed electronics	4
Chemical processes (engineering)	4
Quality management	5
Business management and administration	5

Optional

Mandatory

2nd semester

Mathematics basics	5
Computer basics	5
Testing and calculation mechanical machines	5
Chemical technology	5
Automation and control	5
Electronic Systems and Industrial Instrumentation	5

Optional

Mandatory

2nd course

1st semester

Integrated systems of manufacturing	5
Electrical technology	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
Integrated systems of production	3
Managing human resources and risk prevention	5
Final MS's thesis	12

Mandatory

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		
Mathematics basics						
Computer basics						



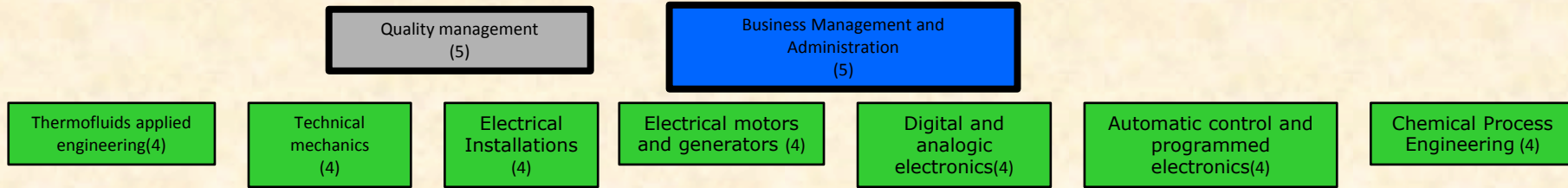
Syllabus



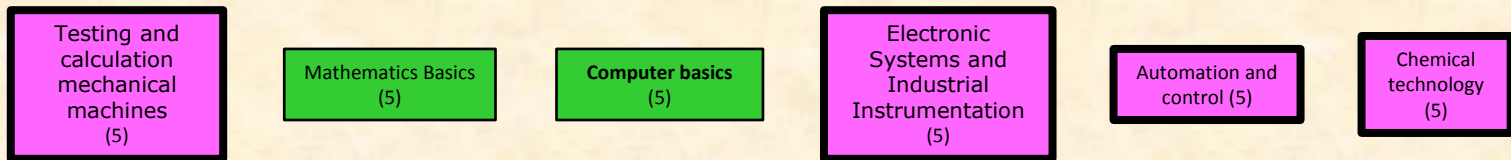
Course-Semester



1-1s



1-2s

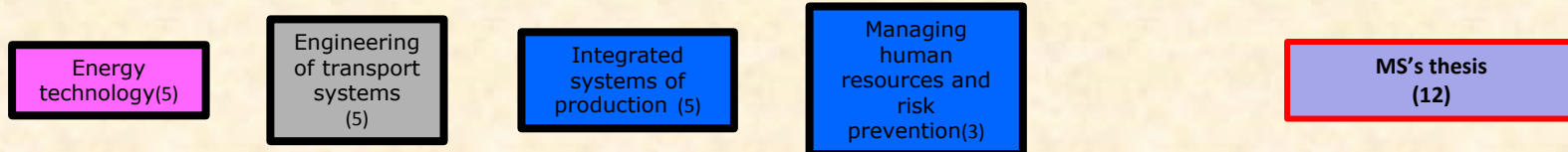


2-1s



Module. INDUSTRIAL TECHNOLOGIES

2-2s



MODULE. INDUSTRIAL FACILITIES, FACTORIES AND COMPLEMENTARY STRUCTURES

MODULE. MANAGEMENT

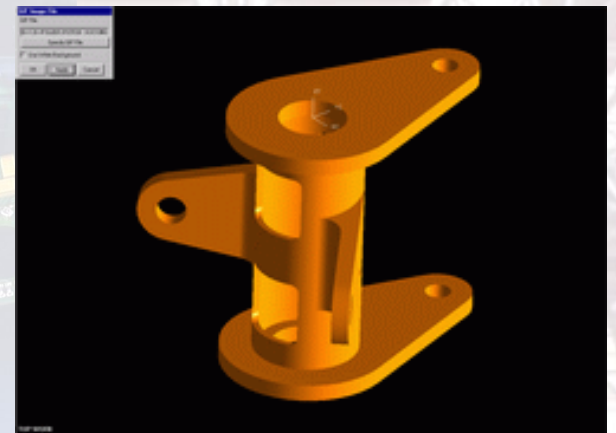
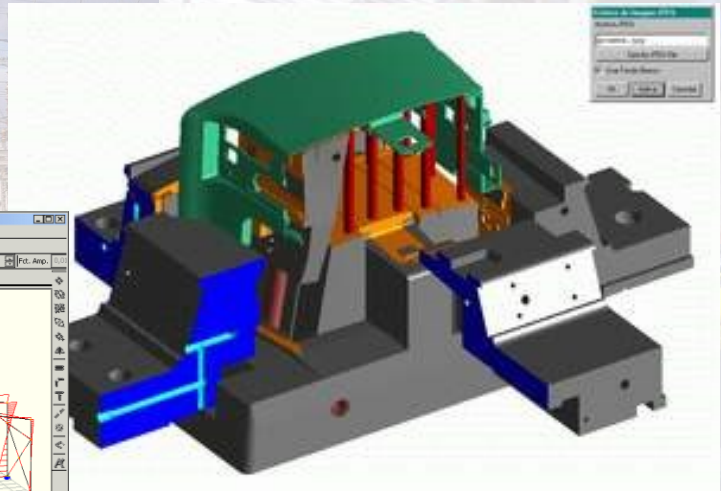
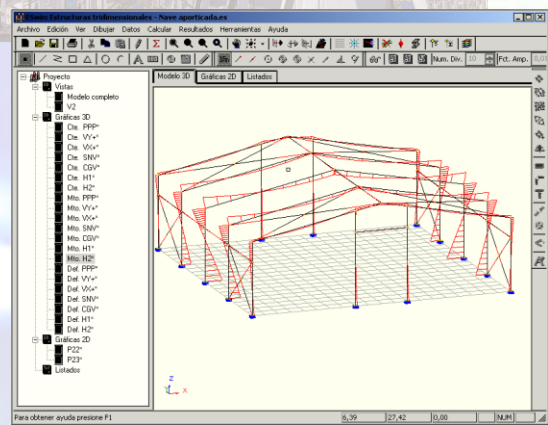
- MODULE INDUSTRIAL TECHNOLOGIES
- MODULE MANAGEMENT
- MODULE INDUSTRIAL FACILITIES, FACTORIES AND COMPLEMENTARY STRUCTURES
- MODULE OPTATIVE SUBJECTS



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.

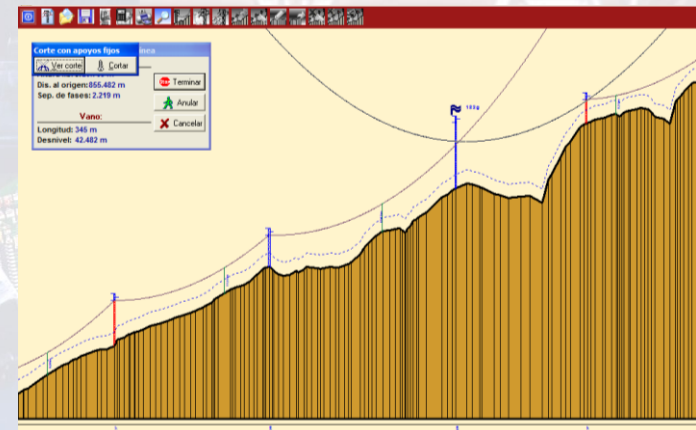
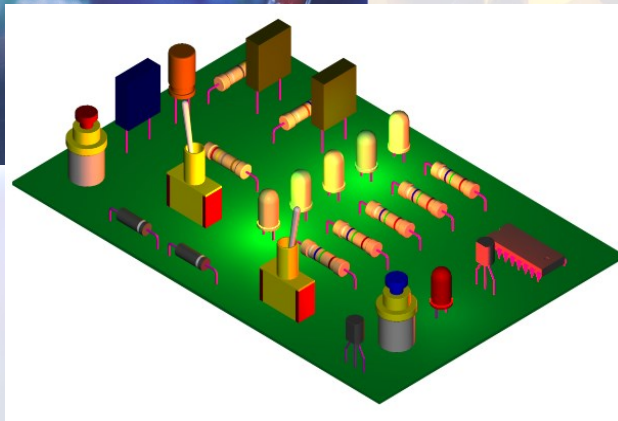
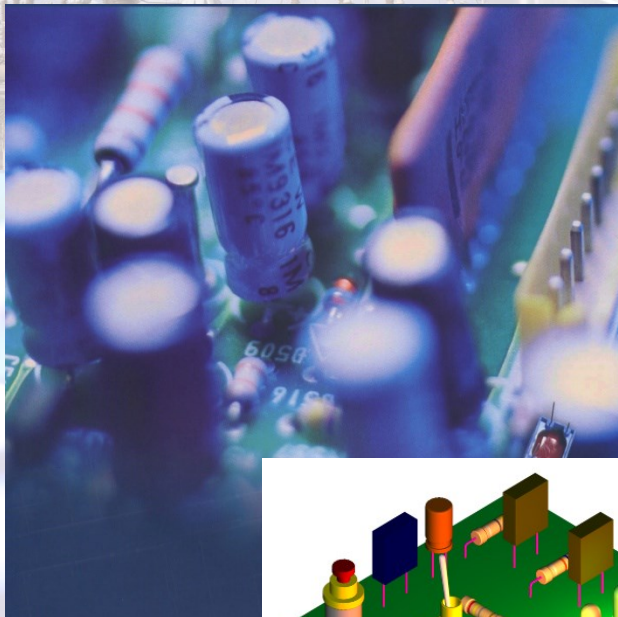




What about the contents?



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 , PVGCPs, 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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