# Semester 1 Master: Electrical Controls

| Unit teaching | Materials Titled | Credits | Coefficient | Hourly volume weekly Courts | TD TP | | Volume Hourly Biannual (15 weeks) | Work Complementary in consultation (15 weeks) | Assessment method Control Continuous | Exam |
|---|---|---|---|---|---|---|---|---|---|---|
| Fundamental EU<br>Code: UEF 1.1.1<br>Credits: 10<br>Coefficients: 5 | Electric power transmission and distribution networks | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| | Advanced power electronics µ- | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | | |
| | processors and µ-controllers | 2 | 1 | 1h30 | | | | 10:30 p.m. | 27:30 | | 100% |
| Fundamental EU<br>Code: UEF 1.1.2<br>Credits: 8<br>Coefficients: 4 | In-depth electrical machines | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| | Applied numerical methods and optimization | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| Methodological EU<br>Code: UEM 1.1<br>Credits: 9<br>Coefficients: 5 | Practical work: - µ-processors and µ-controllers | 1 | 1 | | | | 1 hour | 3:00 p.m. | 10:00 a.m. | 100% | |
| | Practical work: - Electrical energy transport and distribution networks | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Practical work: - Advanced power electronics | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Practical work: Applied numerical methods and optimization | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Practical work: - in-depth electrical machines | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| EU Discovery<br>Code: UED 1.1<br>Credits: 2<br>Coefficients: 2 | Basket of your choice | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| | Basket of your choice | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| Transversal EU<br>Code: UET 1.1<br>Credits: 1<br>Coefficients: 1 | Technical English and Terminology | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| **Total semester 1** | | **30** | **17** | **12:00 p.m. 0** | **6:00 a.m. - 7:00 a.m.** | | **375 hours** | **375 hours** | | |

# Semester 2 Master: Electrical Controls

| Unit teaching | Materials Titled | Credits | Coefficient | Hourly volume weekly Course | TD | TP | | Volume Hourly Biannual (15 weeks) | Work Complementary in consultation (15 weeks) | Assessment method Control Continuous | Exam |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fundamental EU Code: UEF 1.2.1 Credits: 10 Coefficients: 5** | Modeling and identification of electrical systems | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| | Electrical control techniques | 6 | 3 | 3h00 | 1h30 | | | 67h30 | 82h30 | 40% | 60% |
| **Fundamental EU Code: UEF 1.2.2 Credits: 8 Coefficients: 4** | Servitudes sampled and digital regulation | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| | Fault diagnosis control systems | 4 | 2 | 1h30 | 1h30 | | | 45h00 | 55h00 | 40% | 60% |
| **Methodological EU Code: UEM 1.2 Credits: 9 Coefficients: 5** | Practical work Modeling and identification of electrical systems | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Practical work on electrical control techniques | 3 | 2 | | | | 2h30 | 37h30 | 37h30 | 100% | |
| | Practical work Sampled servocontrols and digital regulation | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | TP Fault Diagnosis control systems | 2 | 1 | | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| **EU Discovery Code: UED 1.2 Credits: 2 Coefficients: 2** | Basket of your choice | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| | Basket of your choice | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| **Transversal EU Code: UET 1.2 Credits: 1 Coefficients: 1** | Ethics, professional conduct and intellectual property | 1 | 1 | 1h30 | | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| **Total semester 2** | | **30** | **17** | **12:00** | **6:00** | **7:00** | | **375 hours** | **375 hours** | | |

# Semester 3 Master: Electrical Controls

| Unit teaching | Materials Titled | Credits | Coefficient | Hourly volume weekly Course | TD | TP | Volume Hourly Biannual (15 weeks) | Work Complementary in consultation (15 weeks) | Assessment method Control Continuous | Exam |
|---|---|---|---|---|---|---|---|---|---|---|
| **Fundamental EU Code: UEF 1.3.1 Credits: 10 Coefficients: 5** | Nonlinear control | 4 | 2 | 1h30 | 1h30 | | 45h00 | 55h00 | 40% | 60% |
| | Advanced Commands | 4 | 2 | 1h30 | 1h30 | | 45h00 | 55h00 | 40% | 60% |
| **Fundamental EU Code: UEF 1.3.2 Credits: 8 Coefficients: 4** | Artificial intelligence techniques | 4 | 2 | 1h30 | 1h30 | | 45h00 | 55h00 | 40% | 60% |
| | Electrical control of industrial mechanisms | 6 | 3 | 3:00 a.m. to 1:30 a.m. | | | 67h30 | 82h30 | 40% | 60% |
| **Methodological EU Code: UEM 1.3 Credits: 9 Coefficients: 5** | Nonlinear control TP | 2 | 1 | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Advanced Commands TP | 2 | 1 | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | Practical work on artificial intelligence techniques / Practical work on implementing real-time digital control | 2 | 1 | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | TP Electrical control of industrial mechanisms | 2 | 1 | | | 1h30 | 10:30 p.m. | 27:30 | 100% | |
| | API programming practical work | 1 | 1 | | | 1 hour | 3:00 p.m. | 10:00 a.m. | 100% | |
| **EU Discovery Code: UED 1.3 Credits: 2 Coefficients: 2** | Basket of your choice | 1 | 1 | 1h30 | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| | Basket of your choice | 1 | 1 | 1h30 | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| **Transversal EU Code: UET 1.3 Credits: 1 Coefficients: 1** | Documentary research and dissertation design | 1 | 1 | 1h30 | | | 10:30 p.m. | 2:30 a.m. | | 100% |
| **Total semester 3** | | **30 17** | **12:00** | **6:00** | | **7:00** | **375 hours** | **375 hours** | | |

**Discovery EU *(S1, S2 and S3)***

*1*- Centralized and decentralized production of electrical energy
2- Renewable energies

*3*- Quality of electrical energy
*4*- Maintenance and Operational Safety
*5*- Industrial computing
*6*- Implementation of a real-time digital control
*7*- Electrotechnical materials and their applications
*8*- Special machines
*9*- Industrial Ecology and Sustainable Development
10- Others...

**Semester 4**

Internship in a company leading to a dissertation and a defense.

| | | | |
|---|---|---|---|
| Personal Work | 550 | 09 | 18 |
| Internship in a company | 100 | 04 | 06 |
| Seminars | 50 | 02 | 03 |
| Other (Supervision) | 50 | 02 | 03 |
| Total Semester 4 | 750 | 17 | 30 |

**This table is given for information purposes only.**

**Evaluation of the End of Master's Cycle Project**

- Scientific value (Jury assessment) /6
- Writing the Dissertation (Jury's Assessment) /4
- Presentation and answer to questions (Jury assessment) /4
- Assessment of the supervisor /3
- Presentation of the internship report (Jury assessment) /3