**A1. Programme Specification**

**THE MINISTRY OF EDUCATION AND TRAINING**

**HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY AND EDUCATION**

**Faculty of electrical and electronics engineering**

---

**UNDERGRADUATE PROGRAMME**

**(Full-time Curriculum)**

**Programme:** Electronics and Communication Engineering Technology

**Level:** Undergraduate

**Major:** Electronics and communication engineering technology

**Programme duration:** 4 years

*(Decision No……date… on……..)*

## 1- Enrollment, Grading System, Curriculum and Graduation Requirements

- *Enrollment***:** High-school Graduates
- *Grading system*: 10
- *Curriculum and Graduation Requirements*: Based on regulations of Decision No 43/2007/BGDDT

## 2- The Goals, Objectives, and Expected Learning Outcomes

**Goals:**

The programme is designed to prepare graduates to assume engineering and technology positions in the electronics and communications industry. Graduates of Electronics and Communications Engineering Technology (ECET) program have an ability to demonstrate expertise and career advancement in Electronics and Communications field through the application of fundamental knowledge, skills, and engineering technology tools. They also have potential to contribute significantly to the achievement of their organization's goals as an effective member and an ability to take part in life-long learning by being engaged with civic institutions, educational organizations, and professional societies.

### 2.1. Objectives:

| | |
|---|---|
| PEO-01 | Excel in their engineering careers and/or postgraduate education by utilizing the fundamental mathematical, scientific, and engineering technology principles in formulating and solving electronics and communication engineering problems |
| PEO-02 | Communicate and work effectively in multidisciplinary teams and continue career-long professional development through engagement in lifelong learning |
| PEO-03 | Fulfill the needs of society in solving technical problems using engineering principles, tools and practices, in an ethical and professional manner |

| | |
|---|---|
| PEO-04 | Make technical contributions to design, development, and manufacturing in their practice of electronics and communication engineering technology |

**2.2. Expected Learning Outcomes:**

| | |
|---|---|
| ELO-01 | An ability to apply knowledge of mathematics, science, computer fundamentals, and engineering |
| ELO-02 | An ability to identify, formulate and solve engineering problems and to design a system, component, or process to meet desired needs |
| ELO-03 | An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice |
| ELO-04 | An ability to apply written, oral, and graphical communication in both technical and non-technical environments |
| ELO-05 | An ability to communicate in English |
| ELO-06 | An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting |
| ELO-07 | A recognition of the need for continuous learning, and an ability to engage in life-long learning |
| ELO-08 | An ability to understand the tenants of professional codes of ethics and to apply ethical considerations to realistic problems |
| ELO-09 | Recognize the importance of the global, economic, environmental and societal context in engineering practice |
| ELO-10 | An ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments related to electronics and communication engineering technology |
| ELO-11 | Demonstrate the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers, and engineering technology standards to the building, testing, operation, and maintenance of electronics/ communication systems |

**3- Blocks of knowledge in the whole programme:**150 credits (without Physical Education and National Defense Education knowledge)

**3.1. Block of knowledge**

| **Name** | **Credits** | | |
|---|---|---|---|
| | **Total** | **Compulsion** | **Elective** |
| **General knowledge** | **56** | **50** | **06** |
| Political Education | 12 | 12 | 0 |
| Social Science | 06 | 0 | 06 |
| English | 09 | 09 | 0 |
| Mathematics and Natural Sciences | 23 | 23 | 0 |
| Informatics | 03 | 03 | 0 |
| Introduction to ECET | 03 | 03 | 0 |

| | | | |
|---|---|---|---|
| **Professional knowledge** | **94** | **85** | **09** |
| Electrical and Electronics Core | 26 | 26 | 0 |
| Electrical and Electronics Advanced Core | 23 | 23 | 0 |
| Electronics and Communications Specialization | 33 | 24 | 9 |
| Graduation Thesis and Internship | 12 | 12 | 0 |

**3.2. Programme content**

***a. General knowledge: 56 Credits***

| No. | Course Prefix and Number | Course Title | Cr. | Note |
|---|---|---|---|---|
| **A** | **Political Education and General Laws** | | **12** | |
| 1 | LLCT150105 | Principles of Marxist-Leninism | 5 | |
| 2 | LLCT120314 | Ho Chi Minh's Ideology | 2 | |
| 3 | LLCT230214 | Vietnamese Communist Party Policy of Revolution | 3 | |
| 4 | GELA220405 | General Laws | 2 | |
| **B** | **Introduction to ECET** | | **3** | |
| 1 | IEET130145 | Introduction to ECET | 3 | |
| **C** | **Informatics** | | **3** | |
| 1 | CPRL130064 | C Program Language | 3 | |
| **D** | **Foreign Language** | | **9** | |
| 1 | ENGL130137 | English 1 | 3 | |
| 2 | ENGL230237 | English2 | 3 | |
| 3 | ENGL330337 | English 3 | 3 | |
| **E** | **Mathematics and Natural Sciences** | | **23** | |
| 1 | MATH130101 | Advanced Mathematics 1 | 3 | |
| 2 | MATH130201 | Advanced Mathematics 2 | 3 | |
| 3 | MATH130301 | Advanced Mathematics 3 | 3 | |
| 4 | MATH130401 | Applied Probability | 3 | |
| 5 | PHYS120102 | General Physics A1 | 3 | |
| 6 | PHYS120202 | General PhysicsA2 | 2+1 | |
| 7 | MATH121201 | Complex Functions and Laplace Transforms | 2 | |
| 8 | GCHE130103 | General Chemistry A1 | 3 | |
| **F** | **Social Science (Select 03 free elective courses)** | | **6** | |
| 1 | GEEC220105 | General Economics | 2 | |
| 2 | PLSK320605 | Planning Skill | 2 | |
| 3 | INMA220305 | Introduction to Management | 2 | |

| | | | | |
|---|---|---|---|---|
| 4 | INSO321005 | Introduction to Sociology | 2 | |
| 5 | IQMA220205 | Introduction to Quality Management | 2 | |
| 6 | INLO220405 | Introduction to Logic | 2 | |
| 7 | PRSK320705 | Presentation Skills | 2 | |
| 8 | SYTH220505 | Systems Thinking | 2 | |
| 9 | ULTE121105 | University Learning Method | 2 | |
| 10 | IVNC320905 | Vietnamese Culture | 2 | |
| 11 | TDTS320805 | Technical Writing | 2 | |
| **G** | **Physical Education** | | **5** | |
| 1 | PHED110513 | Physical Education 1 | 1 | |
| 2 | PHED110613 | Physical Education 2 | 1 | |
| 3 | PHED130715 | Physical Education 3 (Elective) | 3 | |
| **H** | **National Defense Education** | | **11** | |

***b. Professional education knowledge: 94 credits***

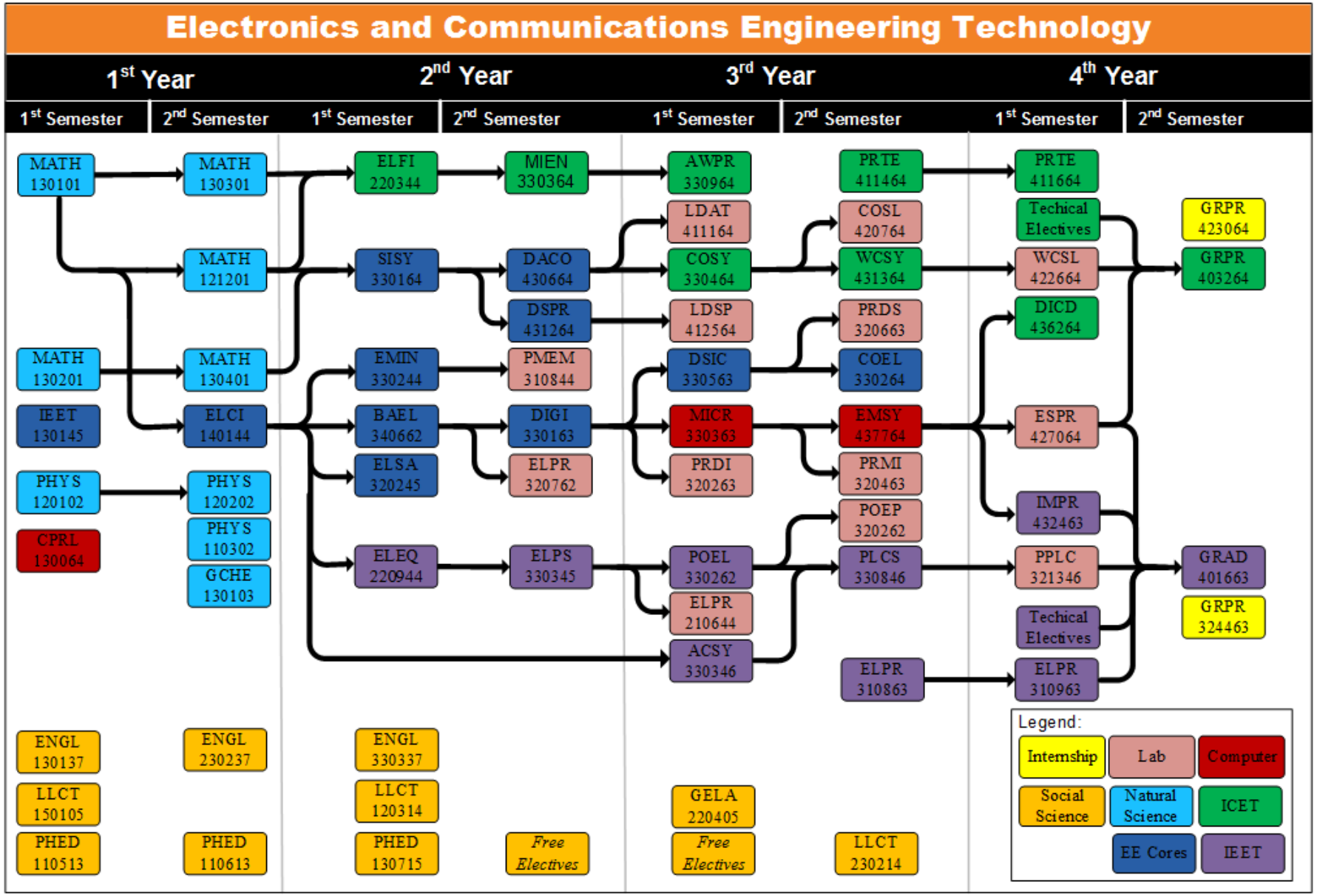
| No. | Course Prefix and Number | Course Title | Cr. | Note |
|---|---|---|---|---|
| **A** | **Electrical and Electronics Core** | | **26** | |
| 1 | ELCI140144 | Electric Circuit | 4 | |
| 2 | BAEL340662 | Basic Electronics | 4 | |
| 3 | DIGI330163 | Digital Systems | 3 | |
| 4 | EMIN330244 | Electrical Measurement and Instruments | 3 | |
| 5 | MICR330363 | Microprocessor | 3 | |
| 6 | ELSA320245 | Electrical Safety | 2 | |
| 7 | ELPR320762 | Electronics Lab | 2 | |
| 8 | PMEM310844 | Measurement Engineering Lab | 1 | |
| 9 | PRDI320263 | Digital Systems Lab | 2 | |
| 10 | PRMI320463 | Microprocessor Lab | 2 | |
| **B** | **Electrical and Electronics Advanced Core** | | **23** | |
| 1 | SISY330164 | Signals and Systems | 3 | |
| 2 | DACO430664 | Data Communication | 3 | |
| 3 | DSPR431264 | Digital Signal Processing | 3 | |
| 4 | COEL330264 | Communication Electronics | 3 | |
| 5 | DSIC330563 | Digital Systems Design with HDLs | 3 | |

| | | | | |
|---|---|---|---|---|
| 6 | EMSY437764 | Embedded Systems | 3 | |
| 7 | LDAT411164 | Data Communication Lab | 1 | |
| 8 | PRDS320663 | Digital Systems Design with HDLs Lab | 2 | |
| 9 | ESPR427064 | Embedded Systems Lab | 2 | |
| **C** | **Electronics and Communications Specialization** | | **33** | |
| **C.1** | ***Integrated-Circuits and Communications Area*** | | | |
| I | *Compulsory Courses* | | *24* | |
| 1 | ELFI220344 | Electromagnetic Field | *2* | |
| 2 | MIEN330364 | Microwave Engineering | 3 | |
| 3 | COSY330464 | Communication Systems | 3 | |
| 4 | AWPR330964 | Antennas and Propagation | 3 | |
| 5 | WCSY431364 | Wireless Communication Systems | 3 | |
| 6 | DICD436264 | Digital Integrated Circuits Design | 3 | |
| 7 | LDSP412564 | Digital Signal Processing Lab | 1 | |
| 8 | COSL420764 | Communication Systems Lab | 2 | |
| 9 | WCSL422664 | Wireless Communication Systems Lab | 2 | |
| 10 | PRTE411464 | Project 1 | 1 | |
| 11 | PRTE411664 | Project 2 | 1 | |
| II | *Elective courses* | | *9* | |
| 1 | MOCO431864 | Mobile Communication | 3 | |
| 2 | MICI431964 | Microwave Circuits | 3 | |
| 3 | FOCO432064 | Optical Communication | 3 | |
| 4 | INTH422164 | Information Theory | 2 | |
| 5 | DICO432264 | Digital Communication | 3 | |
| 6 | IMPR432463 | Image Processing | 3 | |
| 7 | AUVI321563 | Audio and Video Engineering | 2 | |
| 8 | TETM423164 | Advanced Topics in Communication | 2 | |
| 9 | ITFA436064 | Internet of Things: Foundations and Applications | 3 | |
| 10 | AICD433164 | Analog Integrated Circuit Design | 3 | |
| 11 | CONE337764 | Computer and Communication Networks | 3 | |

| | | | | |
|---|---|---|---|---|
| **C.2** | ***Industrial Electronics Area*** | | | |
| I | *Compulsory Courses* | | *24* | |
| 1 | POEL330262 | Power Electronics | *3* | |
| 2 | ACSY330346 | Automatic Control Systems | *3* | |
| 3 | ELEQ220944 | Electrical Equipment | *2* | |
| 4 | PLCS330846 | Programmable Logic Controller | 3 | |
| 5 | ELPS330345 | Electrical Power System | 3 | |
| 6 | IMPR432463 | Image Processing | 3 | |
| 7 | ELPR210644 | Electric Lab | 1 | |
| 8 | POEP320262 | Power Electronics Lab | 2 | |
| 9 | PPLC321346 | Programmable Logic Controller Lab | 2 | |
| 10 | ELPR310863 | Project 1 | 1 | |
| 11 | ELPR310963 | Project 2 | 1 | |
| II | *Elective courses* | | *9* | |
| 1 | SCDA420946 | SCADA Systems | 2 | |
| 2 | RFID321363 | RFID Technology | 2 | |
| 3 | ADMI320763 | Advanced Microprocessor | 3 | |
| 4 | INCO321546 | Intelligent Control | 2 | |
| 5 | IDMA322245 | Industry Management | 2 | |
| 6 | NANO321463 | Nano Technology | 2 | |
| 7 | PLCN422946 | Industrial Communication Network | 2 | |
| 8 | NETT321263 | Research in Modern Electronics Technology | 2 | |
| 9 | ELDA323245 | Electric Drive and Application | 2 | |
| 10 | AUVI321563 | Audio and Video Engineering | 2 | |
| 11 | MALE331063 | Machine Learning | 3 | |
| 12 | BISI331863 | Bio-Signal And -Image Processing | 3 | |
| 13 | SETE331963 | Sensor Technology | 3 | |
| **D** | **Internship and Thesis** | | 12 | |
| **D.1** | **Integrated-Circuits and Communications Electives** | | | |
| 1 | GRPR423064 | Internship | 2 | |
| 2 | GRPR403264 | Thesis | 10 | |
| **D.2** | **Industrial Electronics Area** | | | |

| | | | | |
|---|---|---|---|---|
| 1 | GRPR324463 | Internship | 2 | |
| 2 | GRAD401663 | Thesis | 10 | |

**A2. Recommended ECET curriculum flow chart**



## A3. Mapping of courses to programme outcomes

### A3.1: Mapping of ELOs to PEOs

| PLOs \ ELOs | | Student Expected Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ELO -01 | ELO -02 | ELO -03 | ELO -04 | ELO -05 | ELO -06 | ELO -07 | ELO -08 | ELO -09 | ELO -10 | ELO -11 |
| **Programme Education Objectives** | PEO-01 | **x** | **x** | **x** | | | | | | | | |
| | PEO-02 | | | | **x** | **x** | **x** | **x** | | | | |
| | PEO-03 | | | | | | | | **x** | **x** | | |
| | PEO-04 | | | | | | | | | | **x** | **x** |

### A3.2: Skill matrix of courses

| Type | Course Prefix and Number | Course Title | Student Expected Learning Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **General knowledge** | | | | | | | | | | | | | |
| *Compulsory Courses* | | | | | | | | | | | | | |
| LEC | LLCT150105 | Basic Principles of Marxist- | | | | | | | | | H | | |
| LEC | LLCT120314 | Ho Chi Minh's Theory | | | | | | | | | H | | |
| LEC | LLCT230214 | VN Communist Party | | | | | | | | | H | | |
| LEC | GELA220405 | General Law | | | | | | | | H | H | | |
| OTH | CPRL130064 | C Programming Language | H | M | H | | | | M | | | | |
| LEC | ENGL130137 | English 1 | | | | | H | | | | | | |
| LEC | ENGL230237 | English 2 | | | | | H | | | | | | |
| LEC | ENGL330337 | English 3 | | | | | H | | | | | | |
| LEC | MATH130101 | Advanced Mathematics 1 | H | | | | | | | | | | |
| LEC | MATH130201 | Advanced Mathematics 2 | H | | | | | | | | | | |
| LEC | MATH130301 | Advanced Mathematics 3 | H | | | | | | | | | | |
| LEC | MATH130401 | Applied Statistics | H | | | | | | | | | | |
| LEC | PHYS130102 | General Physics A1 | H | | | | | | | | | | |
| LEC | PHYS120202 | General Physics A2 | H | | | | | | | | | | |
| LAB | PHYS110302 | Physics Experiment | M | | | | | | | | | H | |
| LEC | MATH121201 | Complex Variables and | H | | | | | | | | | | |
| LEC | GCHE130103 | General Chemistry A1 | H | | | | | | | | | | |
| *Free electives* | | | | | | | | | | | | | |
| LEC | GEEC220105 | General Economics | | | | | | | | | H | | |
| LEC | PLSK320605 | Planning Skill | | | | | | | H | | | | |
| LEC | INMA220305 | Introduction to | | | | | | | | | H | | |
| LEC | INSO321005 | Introduction to Sociology | | | | | | | | | H | | |
| LEC | IQMA220205 | Introduction to Quality | | | | | | | | | H | | |
| LEC | INLO220405 | Introduction to Logic | | | | | | | H | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEC | PRSK320705 | Presentation Skills | | | | H | | | | | | | |
| LEC | SYTH220505 | Systems Thinking | | H | | | | | | | | | |
| LEC | ULTE121105 | University Learning | | | | | | | H | | | | |
| LEC | IVNC320905 | Vietnamese Culture | | | | | | | | | H | | |
| LEC | TDTS320805 | Technical Writing | | | | H | | | | | | | |
| **Electrical and Electronics Core** | | | | | | | | | | | | | |
| OTH | INMA133164 | Introduction to ECET | M | M | M | M | | M | M | | | L | L |
| LEC | ELCI140144 | Electric Circuit | H | H | L | | | | H | | | | |
| LEC | BAEL340662 | Basic Electronics | H | H | | | M | | H | | | | |
| LEC | DIGI330163 | Digital Systems | H | H | | | M | | H | | | | |
| LEC | EMIN330244 | Electrical measurement and | H | M | | | | | M | | | M | |
| LEC | MICR330363 | Microprocessor | H | H | | | M | | H | | | | |
| LEC | ELSA320245 | Electrical Safety | H | M | | | L | | H | | | | |
| LAB | ELPR320762 | Electronics Lab | H | H | | | M | | H | | | | |
| LAB | PMEM310844 | Measurement Engineering | H | | H | | M | | L | | | | M |
| LAB | PRDI320263 | Digital Systems Lab | H | H | H | | M | | L | | | | H |
| LAB | PRMI320463 | Microprocessor Lab | M | H | H | | L | | M | | | | H |
| **Electrical and Electronics Advanced Core** | | | | | | | | | | | | | |
| LEC | SISY330164 | Signals and Systems | H | M | L | | | | M | | | | |
| LEC | COEL330264 | Communication Electronics | H | M | | | | | M | | | | |
| LEC | DACO430664 | Data communication | H | M | | | | | M | | | | |
| LEC | DSPR431264 | Digital Signal Processing | H | H | M | | | | M | | | | L |
| DES | DSIC330563 | Digital Systems Design | H | M | | | M | | M | | | | |
| LEC | EMSY427764 | Embedded Systems | H | M | H | | | | M | | | | M |
| LAB | LDAT411164 | Data Communication Lab | M | M | H | | | H | M | H | L | H | M |
| LAB | PRDS320663 | Digital System Design with | M | H | H | | M | | M | | | | H |
| LAB | ESPR427064 | Embedded Systems Lab | M | M | H | | | H | M | H | L | H | M |
| **Integrated-Circuits and Communications Area** | | | | | | | | | | | | | |
| *Compulsory Courses* | | | | | | | | | | | | | |
| LEC | ELFI220344 | Electromagnetic Field | H | | | | | | M | | | | |
| LEC | MIEN330364 | Microwave Engineering | H | M | | | | | M | | | | |
| LEC | COSY330464 | Communication Systems | H | M | L | | | | M | | | | |
| LEC | AWPR330964 | Antennas and Propagation | H | M | L | | | | M | | | | M |
| LEC | WCSY431364 | Wireless Communication | H | M | M | | | | M | | | | M |
| LEC | DICD436264 | Digital Integrated Circuits | H | M | M | | | | M | | | L | H |
| LAB | LDSP412564 | Digital Signal Processing | M | M | H | M | M | H | M | H | L | H | M |
| LAB | COSL420764 | Communication Systems | M | M | H | M | M | H | M | H | L | H | M |
| LAB | WCSL422664 | Wireless Communication | M | M | H | M | M | H | M | H | L | H | M |
| OTH | PRTE411464 | Project 1 | H | H | H | H | M | H | H | H | M | H | H |
| OTH | PRTE411664 | Project 2 | H | H | H | H | M | H | H | H | H | H | H |
| *Elective Courses* | | | | | | | | | | | | | |
| LEC | MOCO431864 | Mobile Communication | H | M | M | | | | M | | | L | H |
| LEC | MICI431964 | Microwave Circuits | H | M | M | | | | M | | | L | H |
| LEC | FOCO432064 | Optical Communication | H | M | M | | | | M | | | L | H |
| LEC | INTH422164 | Information Theory | H | M | H | | | | M | | | L | H |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEC | DICO432264 | Digital Communication | H | M | M | | | | M | | | L | H |
| LEC | IMPR432463 | Image Processing | H | M | M | | | | M | | | L | H |
| LEC | AUVI321563 | Audio and Video | H | M | M | | | | M | | | L | H |
| LEC | TETM423164 | Advanced Topics in Communication | H | M | M | | | | M | | | L | H |
| LEC | ITFA436064 | IoTs: Foundations and | H | M | M | | | | M | | | L | H |
| LEC | AICD433164 | Analog Integrated Circuit | H | M | M | | | | M | | | L | H |
| DES | CONE337764 | Computer and | H | M | M | | | | M | | | L | H |
| **Industrial Electronics Area Core** | | | | | | | | | | | | | |
| *Compulsory Courses* | | | | | | | | | | | | | |
| LEC | POEL330262 | Power Electronics | H | H | | | M | | H | | | | |
| LEC | ACSY330346 | Automatic Control Systems | H | H | | | L | | L | | | | |
| LEC | ELEQ220944 | Electrical Equipment | H | H | | | M | | H | | | | |
| LEC | PLCS330846 | Programmable Logic | H | H | | | M | M | H | | | | |
| LEC | ELPS330345 | Electrical power supply | H | H | | | L | | M | | | | |
| LEC | IMPR432463 | Image Processing | H | H | | | M | M | H | | | | |
| LAB | ELPR210644 | Electric Lab | H | H | H | | | | M | L | | | |
| LAB | POEP320262 | Power Electronics Lab | M | H | H | | L | | | | | | H |
| LAB | PPLC321346 | Programmable Logic | M | H | H | | M | | | | | | H |
| OTH | ELPR310863 | Project 1 | H | H | H | H | M | H | H | H | M | H | H |
| OTH | ELPR310963 | Project 2 | H | H | H | H | M | H | H | H | H | H | H |
| *Elective Courses* | | | | | | | | | | | | | |
| LEC | RFID321363 | RFID Technology | H | M | M | | | | M | | | L | H |
| LEC | ADMI320763 | Advanced Microprocessor | H | M | M | | | | M | | | L | H |
| LEC | INCO321546 | Intelligent control | H | M | M | | | | M | | | L | H |
| LEC | SCDA420946 | SCADA System | H | M | | | | H | M | | | | H |
| LEC | IDMA322245 | Industry management | H | M | M | | | | M | | | L | H |
| LEC | NANO321463 | Nano Technology | H | M | M | | | | M | | | L | H |
| LEC | PLCN422946 | Industrial Communication | H | M | M | | | | M | | | L | H |
| LEC | NETT321263 | Research in Modern | H | M | M | | | | M | | | L | H |
| LEC | ELDA323245 | Electric Drive and | H | M | M | | | | M | | | L | H |
| LEC | AUVI321563 | Audio and Video | H | M | M | | | | M | | | L | H |
| LEC | MALE331063 | Machine Learning | H | M | M | | | | M | | | L | H |
| LEC | BISI331863 | Bio-Signal and -Image | H | M | M | | | | M | | | L | H |
| LEC | SETE331963 | Sensor Technology | H | M | M | | | | M | | | L | H |
| **Thesis** | | | | | | | | | | | | | |
| OTH | GRPR423064 | Internship (ICET) | M | L | H | H | H | H | H | H | H | H | L |
| OTH | GRPR403264 | Thesis (ICET) | H | H | H | H | H | H | H | H | H | H | H |
| OTH | GRPR324463 | Internship (IEET) | M | L | H | H | H | H | H | H | H | H | L |
| OTH | GRAD401663 | Thesis (IEET) | H | H | H | H | H | H | H | H | H | H | H |
| **Number of courses contributing strongly to each programme outcome** | | | **67** | **25** | **23** | **10** | **07** | **14** | **21** | **14** | **15** | **14** | **36** |

| | | |
|---|---|---|
| **Legend** | **LEC -Lecture course** | **H- High contribution** |
| | **LAB - Laboratory course** | **M- Medium Contribution** |
| | **DES - Design course** | **L- Low contribution** |
| | **OTH - Other** | |