# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### I Year –I SEMESTER

| S.NO. | Category | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | HS | Communicative English | 3 | 0 | 0 | 3 |
| 2 | BS | Mathematics –I( Calculus) | 3 | 0 | 0 | 3 |
| 3 | BS | Applied Chemistry | 3 | 0 | 0 | 3 |
| 4 | ES | Programming for Problem Solving Using C | 3 | 0 | 0 | 3 |
| 5 | BS | Engineering Drawing | 2 | 0 | 2 | 3 |
| 6 | LC | English Communication Skills Laboratory | 0 | 0 | 3 | 1.5 |
| 7 | LC | Applied Chemistry Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Programming for Problem Solving Using C Lab | 0 | 0 | 3 | 1.5 |
| **Total Credits** | | | | | | **19.5** |

### I Year – II SEMESTER

| S.No. | Category | Subjects | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | BS | Mathematics –II<br>(Linear Algebra and Numerical Methods) | 3 | 0 | 0 | 3 |
| 2 | BS | Applied Physics | 3 | 0 | 0 | 3 |
| 3 | ES | Object Oriented Programming through Java | 2 | 0 | 2 | 3 |
| 4 | ES | Network Analysis | 3 | 0 | 0 | 3 |
| 5 | ES | Basic Electrical Engineering | 3 | 0 | 0 | 3 |
| 6 | LC | Electronic workshop Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | Basic Electrical Engineering Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Applied Physics Lab | 0 | 0 | 3 | 1.5 |
| 9 | MC | Environmental Science | 3 | 0 | 0 | 0.0 |
| **Total Credits** | | | | | | **19.5** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
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### II Year –I Semester

| S.No. | Category | Name of the Subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Electronic Devices and Circuits | 3 | 1 | 0 | 3 |
| 2 | PC | Switching Theory and Logic Design | 3 | 1 | 0 | 3 |
| 3 | PC | Signals and Systems | 3 | 1 | 0 | 3 |
| 4 | BS | Mathematics-III (Transforms and Vector Calculus) | 3 | 1 | 0 | 3 |
| 5 | BS | Random Variables and Stochastic Processes | 3 | 1 | 0 | 3 |
| 6 | LC | OOPS through Java Lab | 0 | 0 | 2 | 1.5 |
| 7 | LC | Electronic Devices and Circuits -Lab | 0 | 0 | 2 | 1.5 |
| 8 | LC | Switching Theory and Logic Design–Lab | 0 | 0 | 2 | 1.5 |
| 9 | SC | Python Programming | 0 | 0 | 4 | 2 |
| **Total Credits** | | | | | | **21.5** |

### II Year – II Semester

| S.No. | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Electronic Circuit Analysis | 3 | 1 | 0 | 3 |
| 2 | PC | Digital IC Design | 3 | 1 | 0 | 3 |
| 3 | PC | Analog Communications | 3 | 0 | 0 | 3 |
| 4 | ES | Linear control Systems | 3 | 1 | 0 | 3 |
| 5 | HS | Management and Organizational Behavior | 3 | 0 | 0 | 3 |
| 6 | LC | Electronic Circuit Analysis Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | Analog Communications Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Digital IC Design Lab | 0 | 0 | 3 | 1.5 |
| 9 | SC | Soft Skills | 0 | 0 | 4 | 2 |
| 10 | MC | Constitution of India | 3 | 0 | 0 | 0 |
| **Total Credits** | | | | | | **21.5** |
| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | | **4** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
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### III Year - I Semester

| S.No. | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Analog ICs and Applications | 3 | 0 | 0 | 3 |
| 2 | PC | Electromagnetic Waves and Transmission Lines | 3 | 0 | 0 | 3 |
| 3 | PC | Digital Communications | 3 | 0 | 0 | 3 |
| 4 | OE1 | Open Elective Course/Job oriented elective-1 | 2 | 0 | 2 | 3 |
| 5 | PE1 | Professional Elective courses -1 | 3 | 0 | 0 | 3 |
| 6 | LC | Analog ICs and Applications LAB | 0 | 0 | 3 | 1.5 |
| 7 | LC | Digital Communications Lab | 0 | 0 | 3 | 1.5 |
| 8 | SC | Data Structures using Java Lab | 0 | 0 | 4 | 2 |
| 9 | MC | Indian Traditional Knowledge | 2 | 0 | 0 | 0 |
| | **Summer Internship 2 Months (Mandatory) after second year (to be evaluated during V semester** | | 0 | 0 | 0 | 1.5 |
| | | | | | **Total credits** | **21.5** |
| | **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | **4** |

| **PE1:** | **OE1:** |
|---|---|
| 1. Antenna and Wave Propagation<br>2.Electronic Measurements and Instrumentation<br>3.Computer Architecture & Organization | Candidate should select the subject from list of subjects offered by other departments |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
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### III Year –II Semester

| S.No. | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PC | Microprocessor and Microcontrollers | 3 | 1 | 0 | 3 |
| 2 | PC | VLSI Design | 3 | 0 | 0 | 3 |
| 3 | PC | Digital Signal Processing | 3 | 0 | 0 | 3 |
| 4 | PE2 | Professional Elective courses - 2 | 3 | 0 | 0 | 3 |
| 5 | OE 2 | Open Elective Course/Job oriented elective -2 | 2 | 0 | 2 | 3 |
| 6 | LC | Microprocessor and Microcontrollers - Lab | 0 | 0 | 3 | 1.5 |
| 7 | LC | VLSI Design Lab | 0 | 0 | 3 | 1.5 |
| 8 | LC | Digital Signal Processing Lab | 0 | 0 | 3 | 1.5 |
| 9 | SC | ARM based/ Aurdino based Programming | 1 | 0 | 2 | 2 |
| 10 | MC | Research Methodology | 2 | 0 | 0 | 0 |
| | | | | | **Total credits** | **21.5** |
| | **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | **4** |

**Industrial/Research Internship (Mandatory) 2 Months during summer vacation**

| **PE2:** | **OE2:** |
|---|---|
| 1.Microwave Engineering<br>2.Mobile & Cellular Communication<br>3.Embedded Systems<br>4.CMOS Analog IC Design | Candidate should select the subject from list of subjects offered by other departments |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
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### IV Year –I Semester

| S.No. | Category | Name of the subject | L | T | P | Credits |
|---|---|---|---|---|---|---|
| 1 | PE | Professional Elective courses -3 | 3 | 0 | 0 | 3 |
| 2 | PE | Professional Elective courses -4 | 3 | 0 | 0 | 3 |
| 3 | PE | Professional Elective courses -5 | 3 | 0 | 0 | 3 |
| 4 | OE | Open Elective Courses/ Job oriented elective -3 | 2 | 0 | 2 | 3 |
| 5 | OE | Open Elective Courses/ Job oriented elective -4 | 2 | 0 | 2 | 3 |
| 6 | HS | ***Humanities and Social Science Elective** | 3 | 0 | 0 | 3 |
| 7 | SC | **Designer tools (HFSS,** Microwave Studio CST. Cadence Virtuoso. Synopsys, Mentor Graphics, Xilinx.) | 1 | 0 | 2 | 2 |
| **Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester** | | | 0 | 0 | 0 | 3 |
| | | **Total credits** | | | | **23** |
| | **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | | **4** |

| | |
|---|---|
| PE 3:<br><br>1. Optical Communication<br>2. Digital Image Processing<br>3. Low Power VLSI Design | PE5:<br><br>1. Radar engineering<br>2.Pattern recognition & Machine Learning<br>3.Internet of Things |
| PE4:<br><br>1.Satellite Communications<br>2.Soft Computing Techniques<br>3.Digital IC Design using CMOS | |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
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## IV Year – II Semester

| S. No. | Category | Code | Course Title | Hours per week | | | Credits |
|---|---|---|---|---|---|---|---|
| 1 | Major Project | PROJ | Project work, seminar and internship in industry | - | - | - | 12 |
| **INTERNSHIP (6 MONTHS)** | | | | | | | |
| **Total credits** | | | | | | | **12** |

# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA
## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
## SUBJECTS FOR HONORS

**POOL-1**

**Instrumentation and Control Systems:** (any four of the following subjects which are not chosen as professional electives are to be considered for Honors Degree)

| S.No. | SUBJECT | L-T-P | CREDITS |
|---|---|---|---|
| 1 | Data Acquisition systems | 3-1-0 | 4 |
| 2 | Adaptive Control Systems | 3-1-0 | 4 |
| 3 | Bio-Medical Instrumentation | 3-1-0 | 4 |
| 4 | Digital Control Systems | 3-1-0 | 4 |
| 5 | Process Control Instrumentation | 3-1-0 | 4 |
| 6 | Transducers & sensors | 3-1-0 | 4 |
| 7 | MEMS | 3-1-0 | 4 |
| 8 | Intelligent & Smart Instrumentation | 3-1-0 | 4 |
| In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering | | | |

**POOL-2**

**Integrated circuits and Systems:** (any four of the following subjects which are not chosen as professional electives are to be considered for Honors Degree)

| S.No. | SUBJECT | L-T-P | CREDITS |
|---|---|---|---|
| 1 | VLSI Technology and Design | 3-1-0 | 4 |
| 2 | CMOS Analog IC Design | 3-1-0 | 4 |
| 3 | CMOS Digital IC design | 3-1-0 | 4 |
| 4 | Design for Testability | 3-1-0 | 4 |
| 5 | System on Chip | 3-1-0 | 4 |
| 6 | Programmable Logic Devices and ASIC | 3-1-0 | 4 |
| 7 | Scripting Language | 3-1-0 | 4 |
| 8 | Low Power VLSI Design | 3-1-0 | 4 |
| In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering | | | |

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY:: KAKINADA**
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**POOL-3**

**Communication Engineering:** (any four of the following subjects which are not chosen as a professional electives are to be considered for Honors Degree)

| S.No. | SUBJECT | L-T-P | CREDITS |
|---|---|---|---|
| 1 | Wireless Sensor Networks | 3-1-0 | 4 |
| 2 | Software defined radio | 3-1-0 | 4 |
| 3 | Data Communications & Computer Networks | 3-1-0 | 4 |
| 4 | Cognitive radio | 3-1-0 | 4 |
| 5 | 5G Communications | 3-1-0 | 4 |
| 6 | Satellite communication | 3-1-0 | 4 |
| 7 | Optical Communication | 3-1-0 | 4 |
| 8 | Global navigational satellite systems | 3-1-0 | 4 |
| In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering | | | |

**POOL-4**

**Digital Signal processing (any four of the following subjects which are not chosen as professional electives are to be considered for Honors Degree)**

| S.No. | SUBJECT | L-T-P | CREDITS |
|---|---|---|---|
| 1 | Speech Signal Processing | 3-1-0 | 4 |
| 2 | Video Signal Processing | 3-1-0 | 4 |
| 3 | Adaptive Signal Processing | 3-1-0 | 4 |
| 4 | Bio- Medical Signal Processing | 3-1-0 | 4 |
| 5 | DSP Processors and Architectures | 3-1-0 | 4 |
| 6 | Wavelet Theory | 3-1-0 | 4 |
| 7 | Multirate Systems And Filter Banks | 3-1-0 | 4 |
| 8 | Mathematical methods for signal processing | 3-1-0 | 4 |
| In addition to any of the four subjects Compulsory MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) | | | |

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## GENERAL MINOR TRACKS

| S.No. | SUBJECT | L-T-P | CREDITS |
|---|---|---|---|
| 1 | Electronics Devices and Basic Circuits | 3-1-0 | 4 |
| 2 | Digital Electronics | 3-1-0 | 4 |
| 3 | Principles of Communication | 3-1-0 | 4 |
| 4 | Signal Analysis | 3-1-0 | 4 |
| In addition to any of the four subjects, MOOC/NPTEL Courses for 04 credits (02 courses@ 2 credits each) are compulsory in the domain of Electronics and Communication Engineering | | | |

List of the **OPEN ELECTIVES** offered by **ECE** Department to **other Branches**:

1. Basics of Signals and Systems
2. Electronic Measurements and Instrumentation
3. Principles of Signal Processing
4. Industrial Electronics
5. Consumer Electronics
6. Fundamentals of Microprocessors and Microcontrollers
7. Transducers and Sensors
8. IOT and Applications
9. Soft Computing Techniques
10. IC Applications
11. Principles of Communications
12. Basic Electronics
13. Data Communications
14. Digital Logic design
15. Remote Sensing and GIS
16. Bio Medical Instrumentation