

ISO 9001:2015

AICTE-CII: GOLD Category Institute

NAAC-'A' Grade Institute (CGPA: 3.21)

NIRF-2020 Rank Band: 201-250



**KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE**

Opp : Yerragattu Gutta, Hasanparthy (Mandal), WARANGAL - 506 015, Telangana, INDIA.

काकतीय प्रौद्योगिकी एवं विज्ञान संस्थान, वरंगल - ५०६ ०१५ तेलंगाना, भारत  
కాకతీయ సాంకేతిక విజ్ఞాన శాస్త్ర విద్యాలయం, వరంగల్ - ౫౦౬ ౦౧౫ తెలంగాణ, భారతదేశము

(An Autonomous Institute under Kakatiya University, Warangal)

(Approved by AICTE, New Delhi; Recognised by UGC under 2(f) & 12(B); Sponsored by EKASILA EDUCATION SOCIETY)

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## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### **B. TECH.CURRICULUM**

**ACADEMIC YEAR: 2025-26**

## **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

**Revised Undergraduate Rules and Regulations-2024 (URR24-R25)**  
**In accordance with the National Education Policy 2020**  
**w.e.f. A.Y. 2025-26**

**Regulations Governing the**  
**Choice-Based Credit System and**  
**Multiple Entry and Multiple Exit Options**  
**with**  
**Competency-Focused Outcome-Based Curriculum (CF-OBC)**



KAKATIYA INSTITUTE OF TECHNOLOGY & SCIENCE, WARANGAL - 506 015, TELANGANA

(UGC Autonomous Institute Under Kakatiya University, Warangal)

# SCHEME OF INSTRUCTIONS

**B. Tech (ECE) -CURRICULUM(KITSW-URR24R25)**  
**SEMESTER-WISE CURRICULUM WITH SCHEME OF INSTRUCTIONS**

**Abbreviations**

|   |                           |   |                 |
|---|---------------------------|---|-----------------|
| L | Lecture Hours             | T | Tutorial Hours  |
| E | Total Engagement in Hours | P | Practical Hours |
| C | Credit Assigned           |   |                 |

**I SEMESTER**

**Stream – I**

| S. No.                                                                                                                                                                        | Category | Course Code       | Course Title                                                               | Lectures / week |   |   |    |    | Credits |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------|----------------------------------------------------------------------------|-----------------|---|---|----|----|---------|
|                                                                                                                                                                               |          |                   |                                                                            | L               | T | P | O  | E  |         |
| -                                                                                                                                                                             | IKSC     | U24IK100          | AICTE Mandated Student Induction Programme<br>(Universal Human Values - I) |                 |   |   |    |    | -       |
| 1                                                                                                                                                                             | BSC      | U24MH101          | Differential Calculus and Ordinary<br>Differential Equations               | 2               | 1 | - | 6  | 9  | 3       |
| 2                                                                                                                                                                             | BSC      | U24PY102E         | Engineering Physics<br>(for ECE)                                           | 2               | 1 | 2 | 5  | 10 | 4       |
| 3                                                                                                                                                                             | PCC      | U24EC103          | Switching Theory and Logic<br>Design                                       | 2               | 1 | - | 4  | 7  | 3       |
| 4                                                                                                                                                                             | ESC      | U24EC104          | Programming for Problem Solving<br>with C                                  | 2               | 1 | 2 | 5  | 10 | 4       |
| 5                                                                                                                                                                             | ESC      | U24EE105B         | Basic Electrical Engineering<br>(Common to ECE and ECIE)                   | 2               | 1 | 2 | 5  | 10 | 4       |
| 6                                                                                                                                                                             | VAC      | U24CY106          | Environmental Studies                                                      | 2               | - | - | 3  | 5  | -       |
| 7                                                                                                                                                                             | AEC      | U24AE107          | IDEA Lab Makerspace                                                        | -               | - | 2 | 2  | 4  | 1       |
| 8                                                                                                                                                                             | ELC      | U24EL108          | Practicum-1                                                                | -               | - | - | 4  | 4  | 1       |
| 9                                                                                                                                                                             | VAC      | U24VA109X<br>XXXX | SEA - I / SAA-1                                                            | -               | - | - | 2  | 2  | 1       |
| 10                                                                                                                                                                            | AEC      | U24AE110          | Expert Talk Series-1                                                       | -               | - | - | 1  | 1  | 1       |
| Total:                                                                                                                                                                        |          |                   |                                                                            | 12              | 5 | 8 | 37 | 62 | 22      |
| Summer/ Inter-Sem Bridge Courses (Approved by BoS and Dean, AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |                   |                                                                            | -               | - | - | -  | -  | -       |

**II SEMESTER****Stream – I**

| S. No.                                                                                                                                                                        | Category | Course Code | Course Title                                | Lectures / week |   |    |    | Credits |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------------------------------------|-----------------|---|----|----|---------|
|                                                                                                                                                                               |          |             |                                             | L               | T | P  | E  |         |
| 1                                                                                                                                                                             | BSC      | U24MH201    | Matrix Theory and Vector Calculus           | 2               | 1 | -  | 3  | 3       |
| 2                                                                                                                                                                             | BSC      | U24CY202E   | Engineering Chemistry<br>(for ECE)          | 2               | 1 | -  | 3  | 3       |
| 3                                                                                                                                                                             | PCC      | U24EC203    | Electronic Circuits                         | 2               | 1 | -  | 3  | 3       |
| 4                                                                                                                                                                             | ESC      | U24EC204    | Data Structures through C                   | 2               | 1 | -  | 3  | 3       |
| 5                                                                                                                                                                             | HSMC     | U24MH205    | English Communication and Report Writing    | 2               | - | -  | 2  | 2       |
| 6                                                                                                                                                                             | VAC      | U24VA206    | Sports and Yoga                             | -               | - | 2  | 2  | 1       |
| 7                                                                                                                                                                             | ESC      | U24ME207    | Engineering Graphics through CAD            | -               | - | 2  | 2  | 1       |
| 8                                                                                                                                                                             | SEC      | U24SE208    | Programming Skill Development (PSD) Lab - 1 | -               | - | 2  | 2  | 1       |
| 9                                                                                                                                                                             | BSC      | U24CY209E   | Engineering Chemistry Laboratory            | -               | - | 2  | 2  | 1       |
| 10                                                                                                                                                                            | ESC      | U24EC210    | Data Structures through C Laboratory        | -               | - | 2  | 2  | 1       |
| Total:                                                                                                                                                                        |          |             |                                             | 10              | 4 | 10 | 24 | 19      |
| Summer/ Inter-Sem Bridge Courses (Approved by BoS and Dean, AA): 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |             |                                             | -               | - | -  | -  | -       |

### Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute  
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

#### A. After First Year: (UG Certificate in ECE)

(i) The candidate should pass any two of the following additional courses (ITI Level) during the 2-Months internship at institute

| Exit Option to Qualify <b>UG Certificate in ECE</b> : Any Two (02) Courses during the 2 - Months internship |          |             |                                                    |   |   |   |   |   |   |
|-------------------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                                                      | Category | Course Code | Course Title                                       | L | T | P | O | E | C |
| 1                                                                                                           | PCC      | U24EC212X   | Industrial Electronics                             | 2 | - | 2 | - | 4 | 3 |
| 2                                                                                                           | PCC      | U24EC213X   | Electronic Measuring Instruments                   | 2 | - | 2 | - | 4 | 3 |
| 3                                                                                                           | PCC      | U24EC214X   | PCB Design and Fabrication                         | 2 | - | 2 | - | 4 | 3 |
| 4                                                                                                           | PCC      | U24EC215X   | Any other course approved by BoS Chair and Dean AA | 2 | - | 2 | - | 4 | 3 |

(OR)

(ii) Any two suitable skill based courses to qualify for Certification.

| Exit Option to Qualify <b>UG Certificate in ECE</b> : Any Two (02) Skill based Courses :- |          |             |                                                                                                                                                                                                               |   |   |   |   |   |   |
|-------------------------------------------------------------------------------------------|----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                                    | Category | Course Code | Course Title                                                                                                                                                                                                  | L | T | P | O | E | C |
| 1                                                                                         | SEC      | U24SE212X   | Consumer Electronics                                                                                                                                                                                          | - | - | 6 | - | 6 | 3 |
| 2                                                                                         | SEC      | U24SE213X   | DTH set-top-Box Installer and Service technician<br><a href="https://nsdcindia.org/dth-set-top-box-installation-service-technician">https://nsdcindia.org/dth-set-top-box-installation-service-technician</a> | - | - | 6 | - | 6 | 3 |
| 3                                                                                         | SEC      | U24SE214X   | CCTV Installation Technician -IT Hardware<br><a href="https://nsdcindia.org/cctv-installation-technician">https://nsdcindia.org/cctv-installation-technician</a>                                              | - | - | 6 | - | 6 | 3 |
| 4                                                                                         | SEC      | U24SE215X   | Electronics Servicing and Maintenance                                                                                                                                                                         | - | - | 6 | - | 6 | 3 |
| 5                                                                                         | SEC      | U24SE216X   | Any other skill-based course approved by BoS Chair and Dean AA                                                                                                                                                | - | - | 6 | - | 6 | 3 |

**III SEMESTER**

| S. No.                                                                                                                                                   | Category | Course Code | Course Title                                       | Lectures / week |   |   |    | Credits |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------|-----------------|---|---|----|---------|
|                                                                                                                                                          |          |             |                                                    | L               | T | P | E  | C       |
| 1                                                                                                                                                        | BSC      | U24MH301H   | Applied Mathematics (for ECE)                      | 2               | 1 | - | 3  | 3       |
| 2                                                                                                                                                        | PCC      | U24EC302    | Electronic Circuits Analysis and Design            | 2               | 1 | - | 3  | 3       |
| 3                                                                                                                                                        | PCC      | U24EC303    | Digital Design*                                    | 2               | 1 | - | 3  | 3       |
| 4                                                                                                                                                        | PCC      | U24EC304    | Signals and Systems                                | 3               | 1 | - | 4  | 4       |
| 5                                                                                                                                                        | ESC      | U24EC305    | OOP through Java <sup>#</sup>                      | 2               | 1 | - | 3  | 3       |
| 6                                                                                                                                                        | PCC      | U24EC306    | Electronic Circuits Analysis and Design Laboratory | -               | - | 2 | 2  | 1       |
| 7                                                                                                                                                        | SEC      | U24SE307    | Programming Skill Development Lab - 2              | -               | - | 2 | 2  | 1       |
| 8                                                                                                                                                        | PCC      | U24EC308    | Digital Design Laboratory                          | -               | - | 2 | 2  | 1       |
| 9                                                                                                                                                        | ESC      | U24EC309    | OOP through Java Laboratory                        | -               | - | 2 | 2  | 1       |
| Total:                                                                                                                                                   |          |             |                                                    | 11              | 5 | 8 | 24 | 20      |
| Summer/ Inter-Sem Mandatory Bridge Courses: 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |             |                                                    | -               | - | - | -  | -       |

\* Branch Specific Mathematics:

| Branch Specific Mathematics (Pool-4) |             |                                                                                |
|--------------------------------------|-------------|--------------------------------------------------------------------------------|
| S. No.                               | Course Code | Course Title                                                                   |
| 1.                                   | U24MH301A   | Numerical and Statistical Methods (for Civil Engineering)                      |
| 2.                                   | U24MH301B   | Applied Mathematics (for Mechanical Engineering)                               |
| 3.                                   | U24MH301C   | Applied Mathematics (for ECIE)                                                 |
| 4.                                   | U24MH301D   | Discrete Mathematics and Probability Statistics (Common to CSE, CSN, CSO & IT) |
| 5.                                   | U24MH301E   | Essential Mathematics and Statistics for Machine learning (for CSM)            |
| 6.                                   | U24MH301F   | Essential Mathematics and Statistics for Data Science (for CSD)                |
| 7.                                   | U24MH301G   | Applied Mathematics (for EEE)                                                  |
| 8.                                   | U24MH301H   | Applied Mathematics (for ECE)                                                  |

**IV SEMESTER**

| S. No.                                                                                                                                                   | Category | Course Code | Course Title                                 | Lectures / week |   |   |    | Credits |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------|-----------------|---|---|----|---------|
|                                                                                                                                                          |          |             |                                              | L               | T | P | E  | C       |
| 1                                                                                                                                                        | PCC      | U24EC401    | Integrated Circuits Applications             | 2               | 1 | - | 3  | 3       |
| 2                                                                                                                                                        | PCC      | U24EC402    | Communication Systems                        | 2               | 1 | - | 3  | 3       |
| 3                                                                                                                                                        | PCC      | U24EC403    | Electromagnetic Waves and Transmission Lines | 2               | 1 | - | 3  | 3       |
| 4                                                                                                                                                        | PCC      | U24EC404    | Computer Organization and Microprocessors    | 2               | 1 | - | 3  | 3       |
| 5                                                                                                                                                        | ESC      | U24EC405    | Python Programming                           | 3               | 1 | - | 4  | 4       |
| 6                                                                                                                                                        | VAC      | U24VA406B   | Soft and Interpersonal Skills®               | -               | - | 2 | 2  | 1       |
| 7                                                                                                                                                        | PCC      | U24EC408    | Integrated Circuits Applications Laboratory  | -               | - | 2 | 2  | 1       |
| 8                                                                                                                                                        | PCC      | U24EC409    | Communication Systems Laboratory             | -               | - | 2 | 2  | 1       |
| 9                                                                                                                                                        | ESC      | U24EC410    | Python Programming Laboratory                | --              | - | 2 | 2  | 1       |
| 10                                                                                                                                                       | VAC*     | U24CY411*   | Environmental Sciences*                      | 2*              | - | - | 5* | -       |
| Total:                                                                                                                                                   |          |             |                                              | 11              | 5 | 8 | 24 | 20      |
| Summer/ Inter-Sem Mandatory Bridge Courses: 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |             |                                              | -               | - | - | -  | -       |

*\*For Lateral Entry Students Only*

### Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute  
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

### B. After Second Year: (UG Diploma in ECE)

- (i) The candidate should pass any two of the following additional courses (Diploma Level) during the 2-Months internship at institute

| Exit Option to Qualify <b>UG Diploma in ECE: Any Two (02) Courses during the 2 - Months internship</b> |          |             |                                                    |   |   |   |   |   |   |
|--------------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                                                 | Category | Course Code | Course Title                                       | L | T | P | O | E | C |
| 1                                                                                                      | PCC      | U24EC412X   | Basic Embedded Systems                             | 2 | - | 2 | - | 4 | 3 |
| 2                                                                                                      | PCC      | U24EC413X   | Fundamentals of IoT (Internet of Things)           | 2 | - | 2 | - | 4 | 3 |
| 3                                                                                                      | PCC      | U24EC414X   | VLSI Design, Tools & Technology                    | 2 | - | 2 | - | 4 | 3 |
| 4                                                                                                      | PCC      | U24EC415X   | Any other course approved by BoS Chair and Dean AA | 2 | - | 2 | - | 4 | 3 |

(OR)

- (ii) Any two suitable skill-based courses to qualify for Diploma.

| Exit Option to Qualify <b>UG Diploma in ECE: Any Two (02) Skill based Courses -:</b> |          |             |                                                                                                                                                                                                                                                                                                                                     |   |   |   |   |   |   |
|--------------------------------------------------------------------------------------|----------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                               | Category | Course Code | Course Title                                                                                                                                                                                                                                                                                                                        | L | T | P | O | E | C |
| 1                                                                                    | SEC      | U24SE412X   | Digital Cable TV Technician<br><a href="https://www.essc-india.org/images/QPs/Digital%20Cable%20Technician%20-%20Access%20-%20ELE_Q8106_v4.0.pdf">https://www.essc-india.org/images/QPs/Digital%20Cable%20Technician%20-%20Access%20-%20ELE_Q8106_v4.0.pdf</a>                                                                      | - | - | 6 | - | 6 | 3 |
| 2                                                                                    | SEC      | U24SE413X   | Arduino Based Embedded System Design<br><a href="https://www.nielit.gov.in/sites/default/files/headquarter/Certificate%20Course%20in%20ARDUINO%20based%20Embedded%20System%20Design.pdf">https://www.nielit.gov.in/sites/default/files/headquarter/Certificate%20Course%20in%20ARDUINO%20based%20Embedded%20System%20Design.pdf</a> | - | - | 6 | - | 6 | 3 |
| 3                                                                                    | SEC      | U24SE414X   | VLSI Design using EDA Tools<br><a href="https://www.nielit.gov.in/sites/default/files/Delhi/VLSI%20DESIGN%20AND%20TOOL.pdf">https://www.nielit.gov.in/sites/default/files/Delhi/VLSI%20DESIGN%20AND%20TOOL.pdf</a>                                                                                                                  | - | - | 6 | - | 6 | 3 |
| 4                                                                                    | SEC      | U24SE415X   | Optical fiber                                                                                                                                                                                                                                                                                                                       | - | - | 6 | - | 6 | 3 |

|   |     |           |                                                                                                                                                                                                                            |   |   |   |   |   |   |
|---|-----|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
|   |     |           | Technician <a href="https://rajshaladarpan.nic.in/sd2/Home/Public2/VocationalSchool/Curriculum/11th_12th_Telecom.pdf">https://rajshaladarpan.nic.in/sd2/Home/Public2/VocationalSchool/Curriculum/11th_12th_Telecom.pdf</a> |   |   |   |   |   |   |
| 5 | SEC | U24SE416X | Any other skill based course approved by BoS Chair and Dean AA                                                                                                                                                             | - | - | 6 | - | 6 | 3 |

#### **B. Tech Honours with Research:**

**Students opting for B. Tech Honours with Research, shall undergo a 2-Month Mandatory Research Internship-I (5 Credits) at respective department during the summer vacation after IV Semester.**

| S. No.                                                                                                                                                    | Category | Course Code | Course Title                                            | Lectures / week |   |    |    | Credits |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------------------------------------------------|-----------------|---|----|----|---------|
|                                                                                                                                                           |          |             |                                                         | L               | T | P  | E  |         |
| 1                                                                                                                                                         | OEC      | U24OE501    | Open Elective - I                                       | 2               | 1 | -  | 3  | 3       |
| 2                                                                                                                                                         | ESC      | U24EC502    | Linear Control Systems                                  | 2               | 1 | -  | 3  | 3       |
| 3                                                                                                                                                         | PCC      | U24EC503    | Microcontrollers and Applications                       | 2               | 1 | -  | 3  | 3       |
| 4                                                                                                                                                         | PCC      | U24EC504    | VLSI Design                                             | 2               | 1 | -  | 3  | 3       |
| 5                                                                                                                                                         | ESC      | U24EC505    | Artificial Intelligence and Machine Learning            | 2               | 1 | -  | 3  | 3       |
| 6                                                                                                                                                         | IKSC     | U24IK506A   | Essence of Indian Traditional Knowledge                 | 2               | - | -  | 2  | 2       |
| 7                                                                                                                                                         | HSMC     | U24MH507    | Technical English                                       | -               | - | 2  | 2  | 1       |
| 8                                                                                                                                                         | PCC      | U24EC508    | Microcontrollers and Applications Laboratory            | -               | - | 2  | 2  | 1       |
| 9                                                                                                                                                         | PCC      | U24EC509    | VLSI Design Laboratory                                  | -               | - | 2  | 2  | 1       |
| 10                                                                                                                                                        | ESC      | U24EC510    | Artificial Intelligence and Machine Learning Laboratory | -               | - | 2  | 2  | 1       |
| 11                                                                                                                                                        | ELC      | U24EC511    | Seminar                                                 | -               | - | 2  | 2  | 1       |
| Total:                                                                                                                                                    |          |             |                                                         | 12              | 5 | 10 | 27 | 22      |
| Additional Learning@:Maximum credits allowed forHonours/Minor                                                                                             |          |             |                                                         | -               | - | -  | -  | 5       |
| Total credits for Honours/Minor students:                                                                                                                 |          |             |                                                         | -               | - | -  | -  | 27      |
| Summer/ Inter-sem Mandatory Bridge Courses : 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |             |                                                         | -               | - | -  | -  | -       |

**#MULTIDISCIPLINARY OPEN ELECTIVES:** Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

**@List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula**

| Open Elective - I |             |                                                    |
|-------------------|-------------|----------------------------------------------------|
| S. No.            | Course Code | Course Title                                       |
| 1.                | U24OE501A   | Design Thinking                                    |
| 2.                | U24OE501B   | Innovative Product Design and Development          |
| 3.                | U24OE501C   | Entrepreneurship                                   |
| 4.                | U24OE501D   | Design Studio                                      |
| 5.                | U24OE501Z   | Any other course approved by BoS Chair and Dean AA |

**VI SEMESTER**

| S. No.                                                                                                                                                   | Category | Course Code | Course Title                                          | Lectures / week |   |   |    | Credits |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|-------------------------------------------------------|-----------------|---|---|----|---------|
|                                                                                                                                                          |          |             |                                                       | L               | T | P | E  | C       |
| 1                                                                                                                                                        | OEC      | U24OE601    | Open Elective - II                                    | 2               | 1 | - | 3  | 3       |
| 2                                                                                                                                                        | PEC      | U24EC602    | Program Elective -I / MOOCs-I                         | 2               | 1 | - | 3  | 3       |
| 3                                                                                                                                                        | PCC      | U24EC603    | Digital Signal Processing and Applications            | 2               | 1 | - | 3  | 3       |
| 4                                                                                                                                                        | PCC      | U24EC604    | System Verilog for Design and Verification            | 2               | 1 | - | 3  | 3       |
| 5                                                                                                                                                        | PCC      | U24EC605    | Antennas and Wave Propagation                         | 2               | 1 | - | 3  | 3       |
| 6                                                                                                                                                        | IKSC     | U24IK606B   | Universal Human Values-II                             | 2               | - | - | 2  | 2       |
| 7                                                                                                                                                        | PCC      | U24EC607    | Digital Signal Processing and Applications Laboratory | -               | - | 2 | 2  | 1       |
| 8                                                                                                                                                        | PCC      | U24EC608    | System Verilog for Design and Verification Laboratory | -               | - | 2 | 2  | 1       |
| 9                                                                                                                                                        | SEC      | U24SE609    | Programming Skill Development Lab -4                  | -               | - | 2 | 2  | 1       |
| 10                                                                                                                                                       | ELC      | U24EC610    | Mini Project                                          | -               | - | 2 | 2  | 1       |
| Total:                                                                                                                                                   |          |             |                                                       | 12              | 5 | 8 | 25 | 21      |
| Additional Learning@:Maximum credits allowed for Honours/Minor                                                                                           |          |             |                                                       | -               | - | - | -  | 5       |
| Total credits for Honours/Minor students:                                                                                                                |          |             |                                                       | -               | - | - | -  | 26      |
| Summer/ Inter-sem Mandatory Bridge Courses : 1 week to 10 days: 1 credit to each Bridge course underadditional learning (will be printed on grade sheet) |          |             |                                                       | -               | - | - | -  | -       |

| Open Elective - II |             |                                                    |
|--------------------|-------------|----------------------------------------------------|
| S. No.             | Course Code | Course Title                                       |
| 1.                 | U24OE601A   | Management Economics and Accountancy               |
| 2.                 | U24OE601B   | Engineering Finance                                |
| 3.                 | U24OE601C   | Organizational Behaviour                           |
| 4.                 | U24OE601D   | E-Commerce and Digital Marketing                   |
| 5.                 | U24OE601Z   | Any other course approved by BoS Chair and Dean AA |

### Bridge Courses for exit:

Successful completion of two subjects (6-Credits) during 2-months internship at the institute  
OR

Successful completion of two suitable skill based courses (external) to qualify for Certification

### C. After Third Year: (B. Voc. in ECE)

- (i) The candidate should pass any two of the following additional courses (Degree Level) during the 2-Months internship at institute

| Exit Option to Qualify <b>B. Voc in ECE</b> : Any Two (02) Courses during the 2 - Months internship |          |             |                                                    |   |   |   |   |   |   |
|-----------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                                              | Category | Course Code | Course Title                                       | L | T | P | O | E | C |
| 1                                                                                                   | PCC      | U24EC610X   | Low Power VLSI                                     | 2 | - | 2 | - | 4 | 3 |
| 2                                                                                                   | PCC      | U24EC611X   | 5G and beyond 5G communications                    | 2 | - | 2 | - | 4 | 3 |
| 3                                                                                                   | PCC      | U24EC612X   | Real-Time Operating Systems (RTOS)                 | 2 | - | 2 | - | 4 | 3 |
| 4                                                                                                   | PCC      | U24EC613X   | Any other course approved by BoS Chair and Dean AA | 2 | - | 2 | - | 4 | 3 |

(OR)

- (ii) Any two suitable skill based courses to qualify for B. Voc in ECE Degree.

| Exit Option to Qualify <b>B. Voc in ECE</b> : Any Two (02) Skill based Courses -: |          |             |                                                                                                                                                                                                                                                                                                                            |   |   |   |   |   |   |
|-----------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|
| S. No.                                                                            | Category | Course Code | Course Title                                                                                                                                                                                                                                                                                                               | L | T | P | O | E | C |
| 1                                                                                 | SEC      | U24SE610X   | Internet of Things (IOT) using Arduino <a href="https://www.nitttrchd.ac.in/imee/Labmanuals/manual%20Internet%20of%20Things%20I.pdf">https://www.nitttrchd.ac.in/imee/Labmanuals/manual%20Internet%20of%20Things%20I.pdf</a>                                                                                               | - | - | 6 | - | 6 | 3 |
| 2                                                                                 | SEC      | U24SE611X   | Embedded System Design using ARM/Cortex Micro Controller <a href="https://www.nielit.gov.in/aurangabad/content/certificate-course-embedded-system-design-using-arm-cortex-microcontroller-0">https://www.nielit.gov.in/aurangabad/content/certificate-course-embedded-system-design-using-arm-cortex-microcontroller-0</a> | - | - | 6 | - | 6 | 3 |
| 3                                                                                 | SEC      | U24SE612X   | Embedded System using 8051 and Arduino <a href="https://www.nielit.gov.in/sites/default/files/PDF/Training/EmbeddedSystemusing8051andArduino.pdf">https://www.nielit.gov.in/sites/default/files/PDF/Training/EmbeddedSystemusing8051andArduino.pdf</a>                                                                     | - | - | 6 | - | 6 | 3 |
| 4                                                                                 | SEC      | U24SE613X   | Any other skill-based course approved by BoS Chair and Dean AA                                                                                                                                                                                                                                                             | - | - | 6 | - | 6 | 3 |

(Note to HoDs on PCC: Under PCC the departments shall plan appropriate courses upto 6<sup>th</sup> semester covering GATE syllabus).

## VII SEMESTER

| Sl. No.                                                                                                                                                  | Category | Course Code | Course Title                                       | Lectures / week |   |    |    | Credits |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|----------------------------------------------------|-----------------|---|----|----|---------|
|                                                                                                                                                          |          |             |                                                    | L               | T | P  | E  | C       |
| 1                                                                                                                                                        | OEC      | U24OE701    | Open Elective - III                                | 2               | 1 | -  | 3  | 3       |
| 2                                                                                                                                                        | PEC      | U24EC702    | Program Elective - II/ MOOCs-II                    | 2               | 1 | -  | 3  | 3       |
| 3                                                                                                                                                        | PCC      | U24EC703    | Real Time Operating Systems                        | 2               | 1 | -  | 3  | 3       |
| 4                                                                                                                                                        | PCC      | U24EC704    | Internet of Things                                 | 2               | 1 | -  | 3  | 3       |
| 5                                                                                                                                                        | PCC      | U24EC705    | Computer Vision and Image Processing               | 2               | 1 | -  | 3  | 3       |
| 6                                                                                                                                                        | PCC      | U24EC706    | Internet of Things & Sensor Laboratory             | -               | - | 2  | 2  | 1       |
| 7                                                                                                                                                        | ELC      | U24EC707    | Internship Evaluation*                             | -               | - | 2  | 2  | 1       |
| 8                                                                                                                                                        | ELC      | U24EC708    | Major Project, Phase-1 / Industrial Internship - 1 | -               | - | 8  | 8  | 4       |
| Total:                                                                                                                                                   |          |             |                                                    | 10              | 5 | 12 | 27 | 21      |
| Additional Learning@:Maximum credits allowed for Honours/Minor                                                                                           |          |             |                                                    | -               | - | -  | -  | 4       |
| Total credits for Honours/Minor students:                                                                                                                |          |             |                                                    | -               | - | -  | -  | 25      |
| Summer/ Inter-Sem Mandatory Bridge Courses: 1 week to 10 days: 1 credit to each Bridge course under additional learning (will be printed on grade sheet) |          |             |                                                    | -               | - | -  | -  | -       |

**#MULTIDISCIPLINARY OPEN ELECTIVES:** Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

| Open Elective - III |             |                                                        |
|---------------------|-------------|--------------------------------------------------------|
| S. No.              | Course Code | Course Title                                           |
| 1.                  | U24OE701    | Sustainable Waste Management and Circular Economy [CE] |
| 2.                  | U24OE709    | Sustainable AI [CSE(AI&ML)]                            |
| 3.                  | U24OE716    | Cyber Physical Systems [CSE(Networks)]                 |
| 4.                  | U24OE718    | Software Quality Assurance and Testing[CSE]            |
| 5.                  | U24OE727    | Any other course approved by BoS Chair and Dean AA     |

**VIII SEMESTER**

| S. No.                                                          | Category | Course Code | Course Title                                         | Lectures / week |   |    |    | Credits |
|-----------------------------------------------------------------|----------|-------------|------------------------------------------------------|-----------------|---|----|----|---------|
|                                                                 |          |             |                                                      | L               | T | P  | E  | C       |
| 1                                                               | PEC      | U24EC801    | Program Elective - III / MOOCs-III                   | 2               | 1 | -  | 3  | 3       |
| 2                                                               | PEC      | U24EC802    | Program Elective - IV / MOOCs-IV                     | 2               | 1 | -  | 3  | 3       |
| 3                                                               | PCC      | U24EC803    | Radar and Satellite Communications                   | 2               | 1 | -  | 3  | 3       |
| 4                                                               | ELC      | U24EC804    | Major Project, Phase - 2 / Industrial Internship - 2 | -               | - | 12 | 12 | 6       |
| Total:                                                          |          |             |                                                      | 6               | 3 | 12 | 21 | 15      |
| Additional Learning@: Maximum credits allowed for Honours/Minor |          |             |                                                      | -               | - | -  | -  | 4       |
| Total credits for Honours/Minor students:                       |          |             |                                                      | -               | - | -  | -  | 19      |

**#MULTIDISCIPLINARY OPEN ELECTIVES:** Student has to select one course as multidisciplinary open elective from any of the MOPEC Basket of courses offered by other departments.

**@** List of courses for additional learning through MOOCs towards Honours/Minor in Engineering shall be prescribed by the department under Honours/ Minor Curricula

### B. Tech Honours with Research

Students opting for B. Tech Honours with Research, shall Publish a research paper in reputed journal indexed by SCI/ SCOPUS/Web of Science (4 Credits).

### SUMMARY

| SEMESTER | I  | II | III | IV | V  | VI | VII | VIII | TOTAL |
|----------|----|----|-----|----|----|----|-----|------|-------|
| CREDITS  | 22 | 19 | 20  | 20 | 22 | 21 | 21  | 15   | 160   |

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION**  
**ENGINEERING**

**PROGRAM ELECTIVE COURSES (PEC)**

There are six slots allotted to Program Elective Courses (PECs). An example for ECE is given below: Each major specialization of the B. Tech Programme is treated as a vertical.

| VERTICAL/ PE                           | PE1                                                      | PE2                                              | PE3                                             | PE4                                                          |
|----------------------------------------|----------------------------------------------------------|--------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------|
| VERTICAL 1:<br>VLSI                    | U24EC602A:<br>Design for Testability                     | U24EC702A:<br>VLSI Physical design               | U24EC801A:<br>Low power VLSI                    | U24EC802A:<br>MEMS and NEMS                                  |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |
| VERTICAL 2:<br>Advanced Communications | U24EC602B:<br>Data Communication s and Computer Networks | U24EC702B:<br>Wireless and Mobile Communications | U24EC801B:<br>Free Space Optical Communications | U24EC802B:<br>5G and Beyond Wirelesss Communications (5G/6G) |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |
| VERTICAL3:<br>Signal Processing        | U24EC602C:<br>Biomedical Signal Processing               | U24EC702C:<br>Advanced Signal Processing         | U24EC801C:<br>Digital Speech Processing         | U24EC802C:<br>DSP Processors and Architecture                |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |
| VERTICAL 4:<br>Embedded Systems        | U24EC602D:<br>Embedded system Design                     | U24EC702D:<br>Embedded Linux Systems             | U24EC801D:<br>Embedded Automotive Systems       | U24EC802D:<br>Robotics and Intelligent Systems               |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |
| VERTICAL 5:<br>AIML                    | U24EC602E:<br>Deep Learning                              | U24EC702E:<br>Generative Artificial Intelligence | U24EC801E:<br>Natural Language Processing       | U24EC802E:<br>Predictive Analytics                           |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |
| VERTICAL 6:<br>Internet of Things      | U24EC602F:<br>Sensors and Actuators for IoT              | U24EC702F:<br>IoT Architecture and Programming   | U24EC801F:<br>Cloud and Edge Computing for IoT  | U24EC802F:<br>Industrial IoT                                 |
|                                        | (OR)                                                     |                                                  |                                                 |                                                              |
|                                        | <i>Equivalent MOOC approved by BoS Chair and Dean AA</i> |                                                  |                                                 |                                                              |

### **MULTIDISCIPLINARY OPEN ELECTIVE COURSES (MOPEC) SDG - BASKET:**

**The following Courses will be offered by various department under MOPEC-SDG basket to the students of other branches:**

| <b>VII SEMESTER</b> |          |                                                                                                    |
|---------------------|----------|----------------------------------------------------------------------------------------------------|
| 1                   | U24OEX01 | Sustainable Waste Management and Circular Economy (Offered by CE department)                       |
| 2                   | U24OEX02 | Carbon Reduction & Net Zero (Offered by EEE department)                                            |
| 3                   | U24OEX03 | Sustainable Infrastructure (Offered by CE department)                                              |
| 4                   | U24OEX04 | Introduction to Electric Vehicles (Offered by EEE department)                                      |
| 5                   | U24OEX05 | Renewable Energy Systems (Offered by EEE department)                                               |
| 6                   | U24OEX06 | Intelligent Imaging for Sustainable Engineering (Offered by ECE department)                        |
| 7                   | U24OEX07 | IoT based Precision Agriculture Technology for Crop Farming (Offered by CSE (Networks) department) |
| 8                   | U24OEX08 | Environment & Climate IoT (Offered by CSE (Networks) department)                                   |
| 9                   | U24OEX09 | Sustainable AI (Offered by CSE (AI&ML) department)                                                 |
| 10                  | U24OEX10 | Smart Communication Systems for Sustainable Engineering (Offered by ECE department)                |
| 11                  | U24OEX11 | Embedded Systems for Sustainable Innovation (Offered by ECE department)                            |
| 12                  | U24OEX12 | Sensors and Actuators for Sustainable Smart Cities and Healthcare (Offered by ECIE department)     |
| 13                  | U24OEX13 | Sustainable Embedded Solutions for Smart Cities and Healthcare (Offered by ECIE department)        |
| 14                  | U24OEX14 | Internet of Medical Things (Offered by CSE (Networks) department)                                  |
| 15                  | U24OEX15 | AI Ethics (Offered by CSE (AI&ML) department)                                                      |
| 16                  | U24OEX16 | Cyber Physical Systems (Offered by CSE (Networks) department)                                      |
| 17                  | U24OEX17 | Cloud Computing (Offered by CSE Department)                                                        |
| 18                  | U24OEX18 | Software Quality Assurance & Testing (Offered by CSE department)                                   |
| 19                  | U24OEX19 | Software Testing and Quality Assurance (Offered by IT department)                                  |
| 20                  | U24OEX20 | Object Oriented Programming through Java (Offered by IT department)                                |
| 21                  | U24OEX21 | Web Technologies (Offered by IT Department)                                                        |
| 22                  | U24OEX22 | Internetworks and Virtualization (Offered by CSE (Networks) department)                            |
| 23                  | U24OEX23 | Network Automation (Offered by CSE (Networks) department)                                          |
| 24                  | U24OEX24 | Smart and Sustainable Additive Manufacturing (Offered by ME department)                            |
| 25                  | U24OEX25 | Automotive Engineering for Sustainable Development (Offered by ME Department)                      |
| 26                  | U24OEX26 | Sustainable Heat and Energy Engineering (Offered by ME department)                                 |
| 27                  | U24OEX27 | Any other course approved by BoS Chair and Dean AA                                                 |