

## VII SEMESTER

| Sl. No.  | Category | Course Code | Course Title                                       | Lectures / week |   |    |    |    | Credits   |
|--|----------|-------------|--|-----------------|---|----|----|----|-----------|
|  |          |             |  | L               | T | P  | O  | E  |           |
| 1  | MOPEC    | U24OE701YYX | MOPEC Elective -II                                 | 2               | 1 | -  | 3  | 6  | 3         |
| 2  | PEC      | U24EE702    | Program Elective - II/ MOOCs-II                    | 2               | 1 | -  | 4  | 7  | 3         |
| 3  | PCC      | U24EE703    | Power System Operation and Control                 | 2               | 1 | 2  | 4  | 10 | 4         |
| 4  | PCC      | U24EE704    | Utilization of Electric Energy                     | 2               | 1 | -  | 4  | 7  | 3         |
| 5  | PCC      | U24EE705    | Electric Vehicles                                  | 2               | 1 | -  | 4  | 7  | 3         |
| 6  | ELC      | U24EE706    | Internship Evaluation*                             | -               | - | 2  | -  | 2  | 1         |
| 7  | ELC      | U24EE707    | Major Project, Phase-1 / Industrial Internship - 1 | -               | - | 8  | 6  | 14 | 4         |
| Total:   |          |             |  | 10              | 5 | 12 | 25 | 53 | 21        |
| Additional Learning@:Maximum credits allowed for Honours/Minor |          |             |  | -               | - | -  | -  | -  | 4         |
| <b>Total credits for Honours/Minor students:</b>               |          |             |  | -               | - | -  | -  | -  | <b>25</b> |

**#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 complete Research Methodology Course (4 Credits) through MOOCS (OR) a workshop / FDP of not less than one week on "Research Methodologies" (4 Credits).

**Internship Evaluation** for the students opting B. Tech Honours with Research, will be done on the 2-Month Research internship-II.

**SUMMARY:**

| SEMESTER | I  | II | III | IV | V  | VI | VII | VIII | TOTAL |
|----------|----|----|-----|----|----|----|-----|------|-------|
| CREDITS  | 22 | 22 | 24  | 23 | 23 | 22 | 21  | 15   | 172   |

**MULTIDISCIPLINARY OPEN ELECTIVE COURSES (MOPEC) BASKETS:**

There are three slots for MOPEC Courses (5<sup>th</sup>, 7<sup>th</sup> & 8<sup>th</sup> semesters). Students can opt for three courses (one course per semester under the MOPEC slot) from the available 14 MOPEC Baskets.

Students who opt for open elective courses will be thinking of getting introduced to courses other than their program courses to start rooting their professional goals in their breadth component of study to explore jobs in different fields. Hence the department shall carefully offer courses under the MOPEC Basket which create interest and impart basic knowledge and skills across the domains.

**Course code to be followed for all MOPEC courses:**

| U                | 2 | 4 | O              | E | X                                     | 0  | 1 | C                          | E | A            |
|------------------|---|---|----------------|---|---------------------------------------|--|---|----------------------------|---|--------------|
| URR24 Curriculum |   |   | MOPEC Elective |   | Semester in which MOPEC opted (5/7/8) | 1 <sup>st</sup> Subject in that Semester |   | MOPECs offered by CE Dept. |   | Serial Order |

**(I) CIVIL ENGINEERING: CE-MOPEC BASKET**

The following Courses will be offered by Civil Engineering Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01CEA | Engineering Mechanics                              |
| 2                   | U24OEX01CEB | Strength of Materials                              |
| 3                   | U24OEX01CEC | Fluid Mechanics                                    |
| 4                   | U24OEX01CED | Advanced Surveying                                 |
| 5                   | U24OEX01CEE | Energy Efficient Buildings                         |
| 6                   | U24OEX01CEF | Net Zero Buildings                                 |
| 7                   | U24OEX01CEG | Forensic Engineering                               |
| 8                   | U24OEX01CEH | Smart and Resilient Buildings                      |
| 9                   | U24OEX01CEI | Infrastructure Engineering & Management            |
| 10                  | U24OEX01CEJ | Disaster Response & Preparedness                   |
| 11                  | U24OEX01CEK | Introduction to Sustainable Development            |
| 12                  | U24OEX01CEL | Lifeline Services & Disasters                      |
| 13                  | U24OEX01CEZ | Any other course approved by BoS Chair and Dean AA |

**(II) MECHANICAL ENGINEERING: ME-MOPEC BASKET**

The following Courses will be offered by Mechanical Engineering Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |              |                                    |
|---------------------|--------------|------------------------------------|
| 1                   | U24OEX01MEA  | 3D Printing Technologies           |
| 2                   | U24OE X01MEB | Joy of Mechanical Engineering      |
| 3                   | U24OE X01MEC | Introduction to Engineering Design |
| 4                   | U24OE X01MED | Research Methodology               |
| 5                   | U24OE X01MEE | Thermal Science & Engineering      |
| 6                   | U24OEX01MEF  | Automotive Pollution & Control     |

|    |             |  |
|----|-------------|--|
| 7  | U24OEX01CIG | LabVIEW Programming                                |
| 8  | U24OEX01CIH | PLC and DCS  |
| 8  | U24OEX01CII | Microcontrollers and Applications                  |
| 10 | U24OEX01CIJ | Internet of Things                                 |
| 11 | U24OEX01CIK | Non - Destructive Testing                          |
| 12 | U24OEX01CIZ | Any other course approved by BoS Chair and Dean AA |

#### **(V) CSE: CS-MOPEC BASKET**

The following Courses will be offered by CSE Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01CSA | Operating Systems                                  |
| 2                   | U24OEX01CSB | Design and Analysis of Algorithms                  |
| 3                   | U24OEX01CSC | Software Engineering                               |
| 4                   | U24OEX01CSD | Compiler Design                                    |
| 5                   | U24OEX01CSE | Data Mining  |
| 6                   | U24OEX01CSF | Cryptography & Network Security                    |
| 7                   | U24OEX01CSG | High Performance Computing                         |
| 8                   | U24OEX01CSH | Software Quality Assurance & Testing               |
| 9                   | U24OEX01CSZ | Any other course approved by BoS Chair and Dean AA |

#### **(VI) IT ENGINEERING: IT-MOPEC BASKET**

The following Courses will be offered by IT Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01ITA | Computer Networks                                  |
| 2                   | U24OEX01ITB | Ethical hacking                                    |
| 3                   | U24OEX01ITC | Programming with C++                               |
| 4                   | U24OEX01ITD | Web Design Technologies                            |
| 5                   | U24OEX01ITE | Software Project Management                        |
| 6                   | U24OEX01ITF | Java Full stack development                        |
| 7                   | U24OEX01ITG | DevOps   |
| 8                   | U24OEX01ITH | NET Programming                                    |
| 9                   | U24OEX01ITI | Software Testing and Quality Assurance             |
| 10                  | U24OEX01ITZ | Any other course approved by BoS Chair and Dean AA |

#### **(VII) ELECTRICAL ENGINEERING: EE-MOPEC BASKET**

The following Courses will be offered by EEE Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |              |  |
|---------------------|--------------|--|
| 1                   | U24OEX01IEEA | Linear Control Systems                             |
| 2                   | U24OEX01IEEB | Introduction to Electric Vehicles                  |
| 3                   | U24OEX01IEEC | Renewable Energy Systems                           |
| 4                   | U24OEX01IEED | Smart Electric Grid                                |
| 5                   | U24OEX01IEEE | Generation & Utilisation of Electric Energy        |
| 6                   | U24OEX01IEEF | Energy Auditing                                    |
| 7                   | U24OEX01IEEG | Network Analysis and Synthesis                     |
| 8                   | U24OEX01IEEH | Power Electronics                                  |
| 9                   | U24OEX01IEEZ | Any other course approved by BoS Chair and Dean AA |

**(VIII) CSE (DATA SCIENCE): DS-MOPEC BASKET**

The following Courses will be offered by CSE(D) Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01DSA | Exploratory Data Analysis with R Programming       |
| 2                   | U24OEX01DSB | Predictive Analytics and Data Mining               |
| 3                   | U24OEX01DSC | Big data Analytics                                 |
| 4                   | U24OEX01DSD | Machine Learning                                   |
| 5                   | U24OEX01DSE | Deep Learning                                      |
| 6                   | U24OEX01DSF | Data Visualization                                 |
| 7                   | U24OEX01DSG | Social and Information Network Analysis            |
| 8                   | U24OEX01DSH | Web Scraping with Python                           |
| 9                   | U24OEX01DSI | Introduction to MLOps                              |
| 10                  | U24OEX01DSZ | Any other course approved by BoS Chair and Dean AA |

**(IX) CSE (AI&ML) : AI-MOPEC BASKET**

The following Courses will be offered by the CSE(AI&ML) Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01AIA | Artificial Intelligence                            |
| 2                   | U24OEX01AIB | Machine Learning                                   |
| 3                   | U24OEX01AIC | Deep Learning                                      |
| 4                   | U24OEX01AID | Computer Vision and Image Processing               |
| 5                   | U24OEX01AIE | Natural Language Processing                        |
| 6                   | U24OEX01AIF | Exploratory Data Analysis with Python              |
| 7                   | U24OEX01AIG | Robotic Process Automation                         |
| 8                   | U24OEX01AIH | Prompt Engineering for Generative AI               |
| 9                   | U24OEX01AII | MLOps Architecture for LLMs                        |
| 10                  | U24OEX01AIZ | Any other course approved by BoS Chair and Dean AA |

**(X) CSE (NETWORKS): CN-MOPEC BASKET**

The following Courses will be offered by CSE(N) Department under MOPEC basket to the students of other branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01CNA | Computer Networks                                  |
| 2                   | U24OEX01CNB | Cloud Computing                                    |
| 3                   | U24OEX01CNC | Block Chain Technologies                           |
| 4                   | U24OEX01CND | Internetworks and Virtualization                   |
| 5                   | U24OEX01CNE | Network Automation                                 |
| 6                   | U24OEX01CNF | Platforms and System Security                      |
| 7                   | U24OEX01CNG | Data Centre Networking                             |
| 8                   | U24OEX01CNH | Fundamentals of Cyber Security & Tools             |
| 9                   | U24OEX01CNI | SDN for real networks                              |
| 10                  | U24OEX01CNZ | Any other course approved by BoS Chair and Dean AA |

|    |             |  |
|----|-------------|--|
| 11 | U24OEX01ENK | Professional Writing                               |
| 12 | U24OEX01ENL | English Language Enhancement                       |
| 13 | U24OEX01ENZ | Any other course approved by BoS Chair and Dean AA |

#### **(XIV) PHYSICS: PY-MOPEC BASKET**

The following Courses will be offered by PS Department under MOPEC basket to the students of all branches:

| V/VII/VIII SEMESTER |             |   |
|---------------------|-------------|---|
| 1                   | U24OEX01PYA | Science and Technology of Non-Conventional Energy         |
| 2                   | U24OEX01PYB | Laser Systems for Industrial and Engineering Applications |
| 3                   | U24OEX01PYC | Optical Fiber Communication                               |
| 4                   | U24OEX01PYD | Nanomaterials   |
| 5                   | U24OEX01PYE | Fundamentals of Electromagnetism                          |
| 6                   | U24OEX01PYF | Solid State Physics                                       |
| 7                   | U24OEX01PYG | Modern Materials  |
| 8                   | U24OEX01PYH | Experimental Physics                                      |
| 9                   | U24OEX01PYI | Thermodynamics  |
| 10                  | U24OEX01PYZ | Any other course approved by BoS Chair and Dean AA        |

#### **(XV) CHEMISTRY : CY-MOPEC BASKET**

The following Courses will be offered by PS Department under MOPEC basket to the students of all branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01CYA | Nano Bio-Technology                                |
| 2                   | U24OEX01CYB | Computational Chemistry                            |
| 3                   | U24OEX01CYC | Biosensors and Applications                        |
| 4                   | U24OEX01CYD | Fundamentals of Quantum Chemistry                  |
| 5                   | U24OEX01CYE | Stereochemistry                                    |
| 6                   | U24OEX01CYF | Advanced Polymer Chemistry                         |
| 7                   | U24OEX01CYG | Principles and Applications of NMR Spectroscopy    |
| 8                   | U24OEX01CYH | Organic Reaction Mechanisms                        |
| 9                   | U24OEX01CYI | Basic Organic Chemistry                            |
| 10                  | U24OEX01CYZ | Any other course approved by BoS Chair and Dean AA |

#### **(XVI) COMMERCE & MANAGEMENT : CM-MOPEC BASKET**

The following Courses will be offered by MBA Department under MOPEC basket to the students of all branches:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01CMA | Principles of Accountancy                          |
| 2                   | U24OEX01CMB | Finance for Engineers                              |
| 3                   | U24OEX01CMC | Management Principles                              |
| 4                   | U24OEX01CMD | Organizational Behavior                            |
| 5                   | U24OEX01CME | Project Management                                 |
| 6                   | U24OEX01CMF | Operations Management                              |
| 7                   | U24OEX01CMG | Consumer Psychology                                |
| 8                   | U24OEX01CMH | Principles of Marketing Management                 |
| 9                   | U24OEX01CMZ | Any other course approved by BoS Chair and Dean AA |

**(XVII) LIBERAL ARTS\* : LI-MOPEC BASKET**

Students opting Liberal Art courses under MOPEC shall complete the courses through SWAYAM/ NPTEL or any other MOOCS platform:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01LIA | Indian Language-I                                  |
| 2                   | U24OEX01LIB | Indian Language-II                                 |
| 3                   | U24OEX01LIC | Psychology for Well-Being                          |
| 4                   | U24OEX01LID | Foreign Language-I                                 |
| 5                   | U24OEX01LIE | Foreign Language-II                                |
| 6                   | U24OEX01LIF | Introduction to Indian Art -An Aprreciation        |
| 7                   | U24OEX01LIG | Drama Appreciation                                 |
| 8                   | U24OEX01LIH | Cultural Studies                                   |
| 9                   | U24OEX01LII | Film Appreciation                                  |
| 10                  | U24OEX01LIJ | Ethics in Engineering Practice                     |
| 11                  | U24OEX01LIZ | Any other course approved by BoS Chair and Dean AA |

\* Through MOOCS only

**(XVIII) ARTS\*: AR-MOPEC BASKET**

Students opting Arts courses under MOPEC shall complete the courses through SWAYAM/ NPTEL or any other MOOCS platform:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01ARA | Anthropolgy  |
| 2                   | U24OEX01ARB | Ancient India                                      |
| 3                   | U24OEX01ARC | Constitution of INDIA                              |
| 4                   | U24OEX01ARD | Medieval India                                     |
| 5                   | U24OEX01ARE | Geography  |
| 6                   | U24OEX01ARF | Modern India                                       |
| 7                   | U24OEX01ARG | Indian Polity                                      |
| 8                   | U24OEX01ARH | Indian Economy                                     |
| 9                   | U24OEX01ARZ | Any other course approved by BoS Chair and Dean AA |

\* Through MOOCS only

**(XIX) LAW\*: LW-MOPEC BASKET**

Students opting Laws courses under MOPEC shall complete the courses through SWAYAM/ NPTEL or any other MOOCS platform:

| V/VII/VIII SEMESTER |             |  |
|---------------------|-------------|--|
| 1                   | U24OEX01LWA | Law for Engineers                                  |
| 2                   | U24OEX01LWB | Environmental Law                                  |
| 3                   | U24OEX01LWC | Labour Law   |
| 4                   | U24OEX01LWD | IPR and Patent Law                                 |
| 5                   | U24OEX01LWE | Industrial Law                                     |
| 6                   | U24OEX01LWF | Companye Law                                       |
| 7                   | U24OEX01LWG | Administrative Law                                 |
| 8                   | U24OEX01LWH | Alternative Dispute Resoluion                      |
| 9                   | U24OEX01LWZ | Any other course approved by BoS Chair and Dean AA |

\* Through MOOCS only

# First Year -Syllabi

**B. Tech (EEE) –CURRICULUM(KITSW-URR24)**  
**SEMESTER-WISE CURRICULUM WITH SCHEME OF INSTRUCTIONS**

**Abbreviations**

|   |                |   |   |
|---|----------------|---|---|
| L | Lecture Hour   | O | Outside the Class Work (Self Study) Hours |
| T | Tutorial Hour  | E | Total Engagement in Hours                 |
| P | Practical Hour | C | Credit Assigned                           |

**I SEMESTER**

**Stream – I**

| Sl. No.  | Category | Course Code | Course Title  | Lectures / week |   |   |    |    | Credits |
|--|----------|-------------|---|-----------------|---|---|----|----|---------|
|  |          |             |   | L               | T | P | O  | E  | C       |
| -  | IKSC     | U24IK100    | AICTE Mandated Student Induction Programme (Universal Human Values - I) |                 |   |   |    |    | -       |
| 1  | BSC      | U24MH101    | Differential Calculus and Ordinary Differential Equations               | 2               | 1 | - | 6  | 9  | 3       |
| 2  | BSC      | U24PY102D   | Engineering Physics (for EEE)   | 2               | 1 | 2 | 5  | 10 | 4       |
| 3  | PCC      | U24EE103    | Electrical Measurements & Sensors                                       | 2               | 1 | - | 4  | 7  | 3       |
| 4  | ESC      | U24EE104    | Programming for Problem Solving with C                                  | 2               | 1 | 2 | 5  | 10 | 4       |
| 5  | ESC      | U24EE105D   | Basic Electrical Engineering (for EEE)                                  | 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      | U24VA109    | 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) |          |             |   |                 |   |   |    |    |         |