



# Sri Chandrasekharendra Saraswathi Viswa MahaVidyalaya

Declared as Deemed to be university U/s 3 of UGC Act 1956 Accredited with "A" Grade by NAAC

Approved by AICTE, New Delhi | Enathur, kanchipuram-631561

[www.kanchiuniv.ac.in](http://www.kanchiuniv.ac.in)

## Department of Electronics and Communication Engineering

# BE – ECE First year syllabus (2025 -2026)



*"Your Journey to Knowledge Begins Here"*



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

**CURRICULUM**  
**Semester I**

| Sl.No | Course Code | Course Name                           | Category | Hours Per Week |   |   | Credits |           | IA | EA | TM  |
|-------|-------------|---------------------------------------|----------|----------------|---|---|---------|-----------|----|----|-----|
|       |             |                                       |          | L              | T | P |         |           |    |    |     |
| 1.    |             | English                               | AEC -1   | 2              | 0 | 0 | Theory  | Practical | 40 | 60 | 100 |
| 2.    |             | Mathematics –I                        | BSC      | 3              | 1 | 0 | 2       | -         | 40 | 60 | 100 |
| 3.    |             | Engineering Physics                   | BSC      | 3              | 0 | 2 | 4       | 1         | 40 | 60 | 100 |
| 4.    |             | Universal Human Values.               | VAC -1   | 2              | 0 | 0 | 3       | -         | 40 | 60 | 100 |
| 5.    |             | Environmental Science and Engineering | MC-1*    | 2              | 0 | 0 | 2       | -         | 40 | 60 | 100 |
| 6.    |             | Design Thinking                       | VSEC – 1 | 2              | 0 | 0 | 2       | -         | 40 | 60 | 100 |
| 7.    |             | IDEA workshop Lab                     | DIY – I  | 0              | 0 | 2 | 0       | 2         | 40 | 60 | 100 |
| 8.    |             | NASSCOM/SWAYAM PLUS online course     | MC – 2*  | 30Hrs          |   |   | -       | 0         | -  | -  | -   |
| Total |             |                                       |          |                |   |   | 16      |           |    |    |     |

**Semester II**

| Sl.No | Course Code | Course Name                                                         | Category | Hours per Week |   |   | Credits |           | IA | EA | TM  |
|-------|-------------|---------------------------------------------------------------------|----------|----------------|---|---|---------|-----------|----|----|-----|
|       |             |                                                                     |          | L              | T | P | Theory  | Practical |    |    |     |
| 1.    |             | Mathematics –II                                                     | BSC      | 3              | 1 | 0 | 4       | -         | 40 | 60 | 100 |
| 2.    |             | Engineering Chemistry                                               | BSC      | 3              | 0 | 2 | 3       | 1         | 40 | 60 | 100 |
| 3.    |             | Basic Electrical & Electronics Engineering                          | ESC      | 2              | 1 | 0 | 3       | -         | 40 | 60 | 100 |
| 4.    |             | Programming for Problem Solving                                     | ESC      | 3              | 0 | 0 | 2       | -         | 40 | 60 | 100 |
| 5.    |             | Engineering Graphics and design[T&P]                                | ESC      | 2              | 0 | 1 | 3       | -         | 40 | 60 | 100 |
| 6.    |             | Basic Electrical & Electronics Engineering Lab                      | ESC      | 0              | 0 | 2 | -       | 2         | 40 | 60 | 100 |
| 7.    |             | Programming for Problem Solving Lab                                 | ESC      | 0              | 0 | 2 | -       | 2         | 40 | 60 | 100 |
| 8.    |             | Soft skills                                                         | VSEC - 2 | 2              | 0 | 0 | 1       | -         | 40 | 60 | 100 |
| 9.    |             | Industrial visit /survey/Technical Seminar.                         | ELC      | -              | - | - | 1       | -         |    |    |     |
| 10.   |             | NSS/Technical club/Green cell/ Archaeological Site Visit and survey | CEA      | -              | - | - | 1       | -         |    |    |     |
| 11.   |             | NASSCOM/SWAYAM PLUS online course                                   | MC -3*   | 30Hrs          |   |   | 0       | -         | -  | -  | -   |
| Total |             |                                                                     |          |                |   |   | 23      |           |    |    |     |

**Total Credits (in first Year) : 40 Credits**

[ L -Lecture, T- Theory, P-Practical, C-Credit, IA- Internal Assessment, EA- External Assessment, TM-Total Mark]



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

**SEMESTER - I**

| Course Code     |                                                                          | L                 | T | P | C | IA | EA    | TM  |
|-----------------|--------------------------------------------------------------------------|-------------------|---|---|---|----|-------|-----|
| Course Name     | ENGLISH                                                                  | 2                 | 0 | 0 | 2 | 40 | 60    | 100 |
| Course Category | ABILITY ENHANCEMENT COURSE/ HUMANITIES/SOCIAL SCIENCE/ MANAGEMENT COURSE | Syllabus Revision |   |   |   |    | V.1.0 |     |
| Pre-requisite   |                                                                          |                   |   |   |   |    |       |     |

**Course Objectives:**

The course should enable the students:

1. To enhance proficiency in English language skills.
2. To develop ability to think analytically, speculatively and imaginatively.
3. To see themselves as professionals, as part of a discipline with skills and abilities valuable in business, teaching, publishing, etc.

**Course Outcomes:**

On completion of the course, the student will be able to:

| Course Outcomes | Description                                                                                                                                                                                               | Highest Bloom's Taxonomy |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| CO1             | Understand the nuances of grammar and vocabulary in speaking and writing                                                                                                                                  | K2                       |
| CO2             | Listen and comprehend different spoken excerpts critically, infer and implied meanings.                                                                                                                   | K1                       |
| CO3             | Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.                                                               | K4                       |
| CO4             | Read different genres of texts, infer implied meanings and critically analyze and evaluate them for ideas as well as for Method of presentation.                                                          | K2                       |
| CO5             | Write effectively and persuasively and by using different techniques of writing such as narration, description, exposition and argument as well as creative, critical, analytical and Evaluative writing. | K4                       |

**Correlation between Course Outcomes (COs) and Program Outcomes (POs):**

| COs | Program Outcomes (POs) |      |      |      |      |      |      |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|-----|------------------------|------|------|------|------|------|------|------|------|-------|-------|-------|----------------------------------|-------|-------|
|     | PO 1                   | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1                            | PS O2 | PS O3 |
| CO1 | -                      | -    | -    | -    | M    | L    | L    | L    | M    | M     | L     | M     | -                                | -     | -     |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|--------------------|-----------------|---|
| <b>CO2</b>                                                                                                                                                                                                                                   | -                                                                                                                               | - | - | - | M | L | L | L | L | L | L | M | -                  | -               | - |
| <b>CO3</b>                                                                                                                                                                                                                                   | -                                                                                                                               | - | - | - | L | L | L | L | L | L | L | L | -                  | -               | - |
| <b>CO4</b>                                                                                                                                                                                                                                   | -                                                                                                                               | - | - | - | L | L | L | L | L | L | L | L | -                  | -               | - |
| <b>CO5</b>                                                                                                                                                                                                                                   | -                                                                                                                               | - | - | - | M | L | L | L | M | M | L | M | -                  | -               | - |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-I</b>                                                                                                                                                                                                                                | <b>VOCABULARY BUILDING</b>                                                                                                      |   |   |   |   |   |   |   |   |   |   |   | <b>9 Hours</b>     |                 |   |
| The concept of Word Formation - Root words from foreign languages and their use in English - Acquaintance with prefixes and suffixes from foreign languages in English to form Derivatives - Synonyms, antonyms, and standard abbreviations. |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-II</b>                                                                                                                                                                                                                               | <b>BASIC WRITING SKILLS</b>                                                                                                     |   |   |   |   |   |   |   |   |   |   |   | <b>9 Hours</b>     |                 |   |
| Sentence Structures - Use of phrases and clauses in sentences - Importance of proper punctuation - Creating coherence - Organizing principles of paragraphs in documents - Techniques for writing precisely.                                 |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-III</b>                                                                                                                                                                                                                              | <b>IDENTIFYING COMMON ERRORS IN WRITING</b>                                                                                     |   |   |   |   |   |   |   |   |   |   |   | <b>9 Hours</b>     |                 |   |
| Subject-verb agreement - Noun pronoun agreement - Misplaced modifiers - Articles - Prepositions - Redundancies – Clichés.                                                                                                                    |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-IV</b>                                                                                                                                                                                                                               | <b>NATURE AND STYLE OF SENSIBLE WRITING</b>                                                                                     |   |   |   |   |   |   |   |   |   |   |   | <b>9 Hours</b>     |                 |   |
| Describing – Defining – Classifying - Providing examples or evidence -Writing introduction and conclusion.                                                                                                                                   |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-V</b>                                                                                                                                                                                                                                | <b>WRITING PRACTICES</b>                                                                                                        |   |   |   |   |   |   |   |   |   |   |   | <b>9 Hours</b>     |                 |   |
| Comprehension - Précis Writing - Essay Writing.                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>UNIT-VI</b>                                                                                                                                                                                                                               | <b>ORAL COMMUNICATION</b>                                                                                                       |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| (This involves interactive practice sessions in Language Lab)                                                                                                                                                                                |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| Listening Comprehension - Pronunciation, Intonation, Stress and Rhythm - Common Everyday situations: Conversations and Dialogues - Communication at Workplace – Interviews - Formal Presentations                                            |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
|                                                                                                                                                                                                                                              |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   | <b>Total Hours</b> | <b>45 Hours</b> |   |
| <b>Text Book(s)</b>                                                                                                                                                                                                                          |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| 1.                                                                                                                                                                                                                                           | Practical English Usage. MichaelSwan.OUP. 4 <sup>th</sup> edition.                                                              |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| 2.                                                                                                                                                                                                                                           | Remedial English Grammar. F.T.Wood.Macmillan.Jan-2014.                                                                          |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| 3.                                                                                                                                                                                                                                           | On Writing Well William Zinsser. Harper Resource e Book.9 <sup>th</sup> May 2006.                                               |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| <b>Reference Book(s)</b>                                                                                                                                                                                                                     |                                                                                                                                 |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| 1.                                                                                                                                                                                                                                           | Study Writing, Liz Hamp – Lyons and Ben Heasley, Cambridge University Press, 2 <sup>nd</sup> edition, 31 <sup>st</sup> Jan2007. |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |
| 2.                                                                                                                                                                                                                                           | Communication Skills, Sanjay Kumar and Pushpa Lata, Oxford University Press, 2 <sup>nd</sup> Edition, 2015.                     |   |   |   |   |   |   |   |   |   |   |   |                    |                 |   |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                 | L                 | T    | P    | C    | IA   | EA    | TM   |      |       |       |       |                                  |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|------|-------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MATHEMATICS -I                                                                                                  | 3                 | 1    | 0    | 4    | 40   | 60    | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | BASIC SCIENCE COURSE                                                                                            | Syllabus Revision |      |      |      |      | V.1.0 |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
| Course Objectives:<br>The course should enable the students -<br>1. To understand matrix theory, including eigenvalues, eigenvectors, and quadratic forms, for solving engineering problems.<br>2. To apply numerical methods for solving algebraic and transcendental equations using both direct and iterative techniques.<br>3. To learn interpolation, numerical differentiation, and integration methods for approximating functions and values.<br>4. To evaluate multiple integrals and use Beta and Gamma functions in engineering applications.<br>5. To apply vector calculus concepts and theorems to solve problems in physics and engineering fields. |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Description                                                                                                     |                   |      |      |      |      |       |      |      |       |       |       | Highest Bloom's Taxonomy         |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solve problems involving eigenvalues, eigenvectors, and reduce matrices and quadratic forms to canonical forms. |                   |      |      |      |      |       |      |      |       |       |       | K3                               |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Apply numerical methods to find approximate solutions of algebraic and transcendental equations.                |                   |      |      |      |      |       |      |      |       |       |       | K5                               |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Use interpolation techniques and numerical integration/differentiation for estimating values from data.         |                   |      |      |      |      |       |      |      |       |       |       | K5                               |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Evaluate double and triple integrals, and apply Beta and Gamma functions in engineering contexts.               |                   |      |      |      |      |       |      |      |       |       |       | K5                               |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Compute gradient, divergence, and curl, and apply vector integral theorems in physical applications.            |                   |      |      |      |      |       |      |      |       |       |       | K3                               |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                 |                   |      |      |      |      |       |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Program Outcomes (POs)                                                                                          |                   |      |      |      |      |       |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PO 1                                                                                                            | PO 2              | PO 3 | PO 4 | PO 5 | PO 6 | PO7   | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1                            | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | S                                                                                                               | S                 | S    | S    | S    | -    | M     | -    | -    | M     | M     | M     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | S                                                                                                               | S                 | S    | S    | S    | -    | -     | -    | M    | M     | L     | M     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | S                                                                                                               | S                 | S    | S    | S    | -    | M     | -    | L    | M     | L     | M     | -                                | -     | -     |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|-------------|--------|
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | S                                                                                         | S                                                        | S | S | S | - | M | L | M | M | M | M | - | -           | -      |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | S                                                                                         | S                                                        | S | S | S | - | L | - | L | M | L | M | - | -           | -      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| UNIT-I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                           | Matrices                                                 |   |   |   |   |   |   |   |   |   |   |   | 12 Hrs      |        |
| Eigen Value and Eigen Vectors – Properties of Eigen Values – Cayley-Hamilton Theorem – Reduction to Diagonal Form – Reduction of Quadratic Form to Canonical Form – Nature of Quadratic Forms.                                                                                                                                                                                                                                                                                                       |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           | Numerical Solutions to Algebraic Equations               |   |   |   |   |   |   |   |   |   |   |   | 12 Hrs      |        |
| Introduction – Solution of Algebraic and Transcendental Equations – Bisection Method, Method of False Position, Newton’s Method – Solution of Linear Simultaneous Equations – Direct Methods of Solution – Gauss Elimination, Gauss-Jordan Method – Indirect Methods of Solution –Jacobi’s Method, Gauss-Seidel Method.                                                                                                                                                                              |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| UNIT-III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                           | Interpolation, Numerical Differentiation and Integration |   |   |   |   |   |   |   |   |   |   |   | 12 Hrs      |        |
| Finite Differences – Newton’s Interpolation Formula – Interpolation with Unequal Intervals – Lagrange’s Formula – Divided Differences – Newton’s Divided Difference Formula. Numerical Differentiation – Formulae for Derivatives – Numerical Integration – Newton-Cote’s Quadrature Formula – Trapezoidal Rule – Simpson’s 1/3 <sup>rd</sup> Rule – Simpson’s 3/8 <sup>th</sup> Rule.                                                                                                               |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| UNIT-IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           | Multiple Integrals and Beta-Gamma Functions              |   |   |   |   |   |   |   |   |   |   |   | 12 Hrs      |        |
| Double Integrals – Change of Order of Integration – Double Integrals in Polar Coordinates – Area enclosed by Plane Curves – Triple Integrals – Volume of Solids – Beta Function – Gamma Function – Relation between Beta Function and Gamma Function.                                                                                                                                                                                                                                                |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| UNIT-V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                           | Vector Calculus                                          |   |   |   |   |   |   |   |   |   |   |   | 12 Hrs      |        |
| Scalar and Vector Point Functions-Vector Operator del. – Del applied to Scalar Point Functions-Gradient – Del applied to Vector Point Functions-Divergence and Curl – Del applied twice to Point Functions – Del applied to Product of Point Functions – Integration of Vectors – Line Integrals-Circulation-Work – Surface Integral-Flux – Green’s Theorem in the Plane – Stoke’s Theorem – Volume Integral – Divergence Theorem – Irrotational and Solenoidal Fields.(statement only for theorems) |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   | Total Hours | 60 Hrs |
| Text Book(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B.S. Grewal, Higher Engineering Mathematics, 42 <sup>nd</sup> Edition, Khanna Publishers. |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| Reference Book(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                           |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1. <u>Erwin Kreyszig</u> , Advanced Engineering Mathematics, 10 <sup>th</sup> Edition.    |                                                          |   |   |   |   |   |   |   |   |   |   |   |             |        |





**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

| Course Code     |                      | L                 | T | P | C | IA | E<br>A | TM  |
|-----------------|----------------------|-------------------|---|---|---|----|--------|-----|
| Course Name     | ENGINEERING PHYSICS  | 3                 | 0 | 0 | 3 | 40 | 60     | 100 |
| Course Category | BASIC SCIENCE COURSE | Syllabus Revision |   |   |   |    | V.1.0  |     |
| Pre-requisite   |                      |                   |   |   |   |    |        |     |

**Course Objectives:**

The course should enable the students -

1. Theory of Interference-Newton strings, Michelson Interferometer and Fresnel and Fraunhofer diffraction, Diffraction due to “n” slits - Plane Transmission grating.
2. Energy distribution in black body - Planck's law, De Broglie matter waves – dual nature and expression, Schrodinger Time Independent and Dependent, wave equation, Expression for particle in 1-D box and applications.
3. Laser - Principles and Properties, Einstein's theory, Types of lasers – Nd: YAG and CO<sub>2</sub> laser Applications of lasers – IR Thermograph, Optical fibers-Types of optical fibers, Acceptance angle and numerical aperture, Fiber losses, Applications in engineering and medicine.
4. PN Junction diode and Zener diode - V-I characteristics, BJT, SCR, FET, D-MOSFET, E-MOSFET Characteristics, Characteristics of CMOS, Logic Gates and Universal Building Blocks.
5. Fundamentals of dielectric materials, Internal field and Clausius - Mossotti relation, Super conductors-properties and types - BCS theory, Nano materials – Synthesis, Ball milling and PVD method. Principle and properties of SMA and Biomaterials.

**Course Outcomes:**

On completion of the course, the student will be able to

| Course Outcomes | Description                                                                                                                                                                              | Highest Bloom's Taxonomy |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| CO1             | To develop an understanding of the principles of optics.                                                                                                                                 | K2                       |
| CO2             | Experience the diverse applications of the wave equation. Learn the mathematical tools needed to solve quantum Mechanics problems.                                                       | K4                       |
| CO3             | To provide adequate knowledge on laser fundamentals types and applications and to expose the basics of signal propagation through fiber optics                                           | K2                       |
| CO4             | Understand the principles and concepts of semiconductor Physics. Understand and utilize the mathematical models of Semiconductor junctions and MOS transistors for circuits and systems. | K2                       |
| CO5             | Acquire basic knowledge on various newly developed smart materials.                                                                                                                      | K2                       |

**Correlation between Course Outcomes (COs) and Program Outcomes (POs):**

| COs | Program Outcomes (POs) |    |    |    |    |    |    |    |    |    |    |    | Program Specific Outcomes (PSOs) |      |      |
|-----|------------------------|----|----|----|----|----|----|----|----|----|----|----|----------------------------------|------|------|
|     | PO                     | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PO | PS                               | PSO2 | PSO3 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1                                      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | O1      |   |   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|---------|---|---|
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | S                                      | S | M | M | M | L | M | L | M | M  | L  | L  | -       | - | - |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | S                                      | S | S | S | S | M | M | L | M | M  | L  | L  | -       | - | - |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | S                                      | S | S | S | S | M | M | M | M | S  | S  | S  | -       | - | - |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | S                                      | S | S | S | S | L | L | L | M | M  | M  | M  | -       | - | - |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | M                                      | M | M | M | M | S | S | M | M | M  | M  | M  | -       | - | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| UNIT-I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | QUANTUM PHYSICS                        |   |   |   |   |   |   |   |   |    |    |    | 9 Hours |   |   |
| Black body radiation-Planck's law – Energy distribution function, Wave – particle duality-de Broglie matter waves – Concept of wave function and its physical significance – Heisenberg's Uncertainty Principle – Schrodinger's wave equation – Time independent and Time dependent equations– Tunneling -Scanning tunneling microscope.                                                                                                                                                                       |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | LASER PHYSICS                          |   |   |   |   |   |   |   |   |    |    |    | 9 Hours |   |   |
| Einstein's theory of matter - radiation interaction and A and B coefficients; Properties of laser-spontaneous and stimulated emission, amplification of light by population inversion, different types of lasers: solid-state laser(Nd:YAG), gas lasers (CO2), applications –IR Thermography                                                                                                                                                                                                                   |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| UNIT-III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | FIBRE OPTICS.                          |   |   |   |   |   |   |   |   |    |    |    | 9 Hours |   |   |
| Optical fiber- structure – core and cladding - principle [TIR] - types- material, mode, refractive index profile -Fiber losses -Expression for acceptance angle and numerical aperture. Applications- Endoscope and optical fiber Communication.                                                                                                                                                                                                                                                               |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| UNIT-IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SEMICONDUCTOR DEVICES AND APPLICATIONS |   |   |   |   |   |   |   |   |    |    |    | 9 Hours |   |   |
| Introduction to P-N junction Diode and V-I characteristics, Zener diode and its characteristics, Introduction to BJT, its input-output and transfer characteristics, SCR characteristics, FET, MOSFET and CMOS characteristics. Basic logic gates - NAND, NOR as Universal building block.                                                                                                                                                                                                                     |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| UNIT-V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | NEW ENGINEERING MATERIALS              |   |   |   |   |   |   |   |   |    |    |    | 9 Hours |   |   |
| <b>Dielectric materials:</b> Definition – Dielectric Breakdown – Dielectric loss – Internal field – Claussius Mossottirelation. <b>Superconducting materials:</b> Introduction – Properties- Meissner effect – Type I & Type II superconductors – BCStheory-Applications. <b>Nanomaterials:</b> Introduction – Synthesis of nano materials – Top down and Bottom up approach- Ball milling- PVD method- Applications. <b>Smart materials:</b> Shape memory alloys- Biomaterials (properties and applications). |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| LIST OF EXPERIMENTS FOR LABORATORY COURSE [Any 8]                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| [1]. Determination of Rigidity Modulus & Moment of Inertia using Torsional Pendulum.                                                                                                                                                                                                                                                                                                                                                                                                                           |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |
| [2]. Determination of Young's Modulus.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |   |   |   |   |   |   |   |   |    |    |    |         |   |   |





**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

- [3]. Determination of Wavelength of Laser light using transmission grating.
- [4]. Determination of particle size using LASER
- [5]. Measurement of numerical aperture of an optical fiber.
- [6]. Determination of wavelength of light using Newton's Rings apparatus.
- [7]. Determination of Velocity of sound waves in liquid using Ultrasonic interferometer.
- [8]. Determination of wavelength of prominent colors of mercury spectrum using grating.
- [9]. Determination of number of lines per meter of the grating using normal incidence method.
- [10]. Determination of refractive index of the given prism using minimum deviation method.
- [11]. Determination of emissivity of the surface of a black body.
- [12]. Basic logic gates- Verification of truth tables
- [13]. NAND-Universal building block
- [14]. NOR-Universal building block
- [15]. Zener diode- I-V characteristics
- [16]. Study of LCR circuit

|                    |                 |
|--------------------|-----------------|
| <b>Total Hours</b> | <b>45 Hours</b> |
|--------------------|-----------------|

**Text Book(s)**

- |    |                                                                                                         |
|----|---------------------------------------------------------------------------------------------------------|
| 1. | Sathyaprakash, "Quantum Mechanics", Pragati Prakashan, 2016 [unit I]                                    |
| 2. | K.Venkatramanan, R.Raja, M.Sundarrajan, "Applied Physics for Engineers", SciTech, 2014 [units II,III,V] |
| 3. | V.K.Mehta, "Principles of Electronics", S Chand & Co, 2014 [unit –IV]                                   |

**Reference Book(s)**

- |    |                                                                                           |
|----|-------------------------------------------------------------------------------------------|
| 1. | V. Devanathan, "Quantum Mechanics", Narosa, 2011                                          |
| 2. | M.N. Avadhanulu, "Engineering Physics", S Chand & Co, 2007                                |
| 3. | B L Theraja, "Basic Electronics (Solid State)", S Chand & Co, 2005                        |
| 4. | D. Halliday, R. Resnick and J. Walker, "Fundamentals of Physics", Wiley, 2001             |
| 5. | Arthur Beiser, Shobhit Mahajan, "Concepts of Modern Physics", McGraw Hill Education, 2009 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                    |                   |      |      |      |       |                          |      |                                        |       |       |       |                                  |       |                |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|----------------------------------------|-------|-------|-------|----------------------------------|-------|----------------|--|
| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                    | L                 | T    | P    | C    | IA    | EA                       | TM   |                                        |       |       |       |                                  |       |                |  |
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | UNIVERSAL HUMAN VALUES                                                                                                                             | 2                 | 0    | 0    | 3    | 40    | 60                       | 100  |                                        |       |       |       |                                  |       |                |  |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | VALUE ADDED COURSE                                                                                                                                 | Syllabus Revision |      |      |      | V.1.0 |                          |      |                                        |       |       |       |                                  |       |                |  |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Nil                                                                                                                                                |                   |      |      |      |       |                          |      |                                        |       |       |       |                                  |       |                |  |
| <b>Course Objectives:</b><br>The course should enable the students -<br>1.To appreciate the complementarities between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings<br>2.To facilitate the development of a Holistic perspective among students towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence.<br>3.To highlight Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.<br>4.This course is intended to provide a much-needed orientation input in value education to the young enquiring minds. |                                                                                                                                                    |                   |      |      |      |       |                          |      |                                        |       |       |       |                                  |       |                |  |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                    |                   |      |      |      |       |                          |      |                                        |       |       |       |                                  |       |                |  |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Description                                                                                                                                        |                   |      |      |      |       | Highest Bloom's Taxonomy |      |                                        |       |       |       |                                  |       |                |  |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Become more responsible in life and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.   |                   |      |      |      |       | K2                       |      |                                        |       |       |       |                                  |       |                |  |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Have better critical ability.                                                                                                                      |                   |      |      |      |       | K2                       |      |                                        |       |       |       |                                  |       |                |  |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Become sensitive to their commitment towards what they have understood (human values, human relationship and human society).                       |                   |      |      |      |       | K2                       |      |                                        |       |       |       |                                  |       |                |  |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction. |                   |      |      |      |       | K3                       |      |                                        |       |       |       |                                  |       |                |  |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                    |                   |      |      |      |       |                          |      |                                        |       |       |       |                                  |       |                |  |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Program Outcomes (POs)                                                                                                                             |                   |      |      |      |       |                          |      |                                        |       |       |       | Program Specific Outcomes (PSOs) |       |                |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PO 1                                                                                                                                               | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9                                   | PO 10 | PO 11 | PO 12 | PS O1                            | PS O2 | PS O3          |  |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                                                                                  | -                 | -    | -    | -    | S     | M                        | L    | L                                      | M     | L     | L     | L                                | L     | L              |  |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                                                                                  | -                 | -    | -    | -    | -     | -                        | M    | -                                      | -     | M     | S     | L                                | M     | L              |  |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                                                                                  | -                 | -    | -    | -    | S     | S                        | M    | M                                      | S     | M     | L     | L                                | L     | M              |  |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                                                                                  | -                 | -    | -    | -    | L     | M                        | L    | S                                      | M     | L     | L     | L                                | M     | M              |  |
| <b>UNIT-I</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                    |                   |      |      |      |       |                          |      | <b>INTRODUCTION TO VALUE EDUCATION</b> |       |       |       |                                  |       | <b>9 Hours</b> |  |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                       |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education) Understanding Value Education, Self-exploration as the Process for Value Education, Continuous Happiness and Prosperity – the Basic Human Aspirations, Happiness and Prosperity – Current Scenario, Method to Fulfill the Basic Human Aspirations.    |                                                                                                                                                                                       |          |
| UNIT-II                                                                                                                                                                                                                                                                                                                                                        | HARMONY IN THE HUMAN BEING                                                                                                                                                            | 9 Hours  |
| Understanding Human being as the Co-existence of the Self and the Body, Distinguishing between the Needs of the Self and the Body, The Body as an Instrument of the Self, Understanding Harmony in the Self, Harmony of the Self with the Body, Programme to ensure self-regulation and Health.                                                                |                                                                                                                                                                                       |          |
| UNIT-III                                                                                                                                                                                                                                                                                                                                                       | HARMONY IN THE FAMILY AND SOCIETY                                                                                                                                                     | 9 Hours  |
| Harmony in the Family – the Basic Unit of Human Interaction, 'Trust' – the Foundational Value in Relationship, 'Respect' – as the Right Evaluation, Other Feelings, Justice in Human-to Human Relationship, Understanding Harmony in the Society, Vision for the Universal Human Order.                                                                        |                                                                                                                                                                                       |          |
| UNIT-IV                                                                                                                                                                                                                                                                                                                                                        | HARMONY IN THE NATURE/EXISTENCE                                                                                                                                                       | 9 Hours  |
| Understanding Harmony in the Nature, Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature, Realizing Existence as Co-existence at All Levels, Holistic Perception of Harmony in Existence.                                                                                                                               |                                                                                                                                                                                       |          |
| UNIT-V                                                                                                                                                                                                                                                                                                                                                         | IMPLICATIONS OF THE HOLISTIC UNDERSTANDING – A<br>LOOK AT PROFESSIONAL ETHICS                                                                                                         | 9 Hours  |
| Natural Acceptance of Human Values, Definitiveness of (Ethical) Human Conduct, A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order, Competence in Professional Ethics Holistic Technologies, Production Systems and Management Models-Typical Case Studies, Strategies for Transition towards Value-based Life and Profession. |                                                                                                                                                                                       |          |
| Total Hours                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                       | 45 Hours |
| Text Book(s)                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                       |          |
| 1.                                                                                                                                                                                                                                                                                                                                                             | The Textbook A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 97893-87034-47-1. |          |
| 2.                                                                                                                                                                                                                                                                                                                                                             | The Teacher’s Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G                                                                          |          |
| Reference Book(s)                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                       |          |
| 1.                                                                                                                                                                                                                                                                                                                                                             | Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amar kantak, 1999.                                                                                                      |          |
| 2.                                                                                                                                                                                                                                                                                                                                                             | Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.                                                                                                               |          |
| 3.                                                                                                                                                                                                                                                                                                                                                             | The Story of Stuff (Book).                                                                                                                                                            |          |
| 4.                                                                                                                                                                                                                                                                                                                                                             | The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi                                                                                                                |          |
| 5.                                                                                                                                                                                                                                                                                                                                                             | Small is Beautiful - E. F Schumacher                                                                                                                                                  |          |
| 6.                                                                                                                                                                                                                                                                                                                                                             | Slow is Beautiful - Cecile Andrews                                                                                                                                                    |          |



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

|     |                                                                                                                                                    |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.  | Economy of Permanence - J C Kumarappa                                                                                                              |
| 8.  | Bharat Mein Angreji Raj – Pandit Sunderlal                                                                                                         |
| 9.  | Rediscovering India - by Dharampal                                                                                                                 |
| 10. | Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi                                                                                            |
| 11. | India Wins Freedom - Maulana Abdul Kalam Azad                                                                                                      |
| 12. | Vivekananda - Romain Rolland (English)                                                                                                             |
| 13. | Gandhi - Romain Rolland (English)                                                                                                                  |
| 14. | Sussan George, 1976, How the Other Half Dies, Penguin Press. Reprinted 1986, 1991                                                                  |
| 15. | Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth – Club of Rome's report, Universe Books.     |
| 16. | A Nagraj, 1998, JeevanVidya EkParichay, Divya Path Sansthan, Amarkantak.                                                                           |
| 17. | P L Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.                                                                            |
| 18. | A N Tripathy, 2003, Human Values, New Age International Publishers.                                                                                |
| 19. | Subhas Palekar, 2000, How to practice Natural Farming, Pracheen (Vaidik) KrishiTantra Shodh, Amravati.                                             |
| 20. | E G Seebauer & Robert L. Berry, 2000, Fundamentals of Ethics for Scientists & Engineers , Oxford University Press                                  |
| 21. | M Govindrajran, S Natrajan & V.S. Senthil Kumar, Engineering Ethics (including Human Values), Eastern Economy Edition, Prentice Hall of India Ltd. |
| 22. | B P Banerjee, 2005, Foundations of Ethics and Management, Excel Books.                                                                             |
| 23. | B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.                                                 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                   |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------|-----|-----|-----|-----|--------------------------|-----|-----|------|------|------|----------------------------------|------|------|
| Course Code                                                                                                                                                                                                                                                                                                                       |                                                                | L                 | T   | P   | C   | IA  | EA                       | TM  |     |      |      |      |                                  |      |      |
| Course Name                                                                                                                                                                                                                                                                                                                       | ENVIRONMENT SCIENCE AND ENGINEERING                            | 2                 | 0   | 0   | 0   | 40  | 60                       | 100 |     |      |      |      |                                  |      |      |
| Course Category                                                                                                                                                                                                                                                                                                                   | MANDATORY COURSE (MC)*                                         | Syllabus Revision |     |     |     |     | V.1.0                    |     |     |      |      |      |                                  |      |      |
| Pre-requisite                                                                                                                                                                                                                                                                                                                     |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| <b>Course Objectives:</b><br>The course should enable the students<br>1. To study the nature and facts about environment.<br>2. To finding and implementing scientific, technological, economic and political solutions to environmental problems.<br>3. To study the inter relationship between living organism and environment. |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
|                                                                                                                                                                                                                                                                                                                                   |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                               |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| Course Outcomes                                                                                                                                                                                                                                                                                                                   | Description                                                    |                   |     |     |     |     | Highest Bloom's Taxonomy |     |     |      |      |      |                                  |      |      |
| CO1                                                                                                                                                                                                                                                                                                                               | Nature of environment and reasons for environmental problems.  |                   |     |     |     |     | K4                       |     |     |      |      |      |                                  |      |      |
| CO2                                                                                                                                                                                                                                                                                                                               | Ecosystem – structure, functions, simplified co-system models. |                   |     |     |     |     | K6                       |     |     |      |      |      |                                  |      |      |
| CO3                                                                                                                                                                                                                                                                                                                               | Natural resources, reasons for over exploitation of resources. |                   |     |     |     |     | K2                       |     |     |      |      |      |                                  |      |      |
| CO4                                                                                                                                                                                                                                                                                                                               | The interrelationship between living organism and environment. |                   |     |     |     |     | K4                       |     |     |      |      |      |                                  |      |      |
| CO5                                                                                                                                                                                                                                                                                                                               | Public awareness of environmental is at infant stage.          |                   |     |     |     |     | K2                       |     |     |      |      |      |                                  |      |      |
|                                                                                                                                                                                                                                                                                                                                   |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                      |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| COs                                                                                                                                                                                                                                                                                                                               | Program Outcomes (POs)                                         |                   |     |     |     |     |                          |     |     |      |      |      | Program Specific Outcomes (PSOs) |      |      |
|                                                                                                                                                                                                                                                                                                                                   | PO1                                                            | PO2               | PO3 | PO4 | PO5 | PO6 | PO7                      | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1                             | PSO2 | PSO3 |
| CO1                                                                                                                                                                                                                                                                                                                               | L                                                              | L                 | L   | L   | -   | M   | M                        | S   | M   | M    | M    | L    | -                                | -    | -    |
| CO2                                                                                                                                                                                                                                                                                                                               | M                                                              | M                 | M   | M   | L   | M   | M                        | S   | M   | M    | M    | L    | -                                | -    | -    |
| CO3                                                                                                                                                                                                                                                                                                                               | -                                                              | -                 | -   | -   | M   | M   | M                        | S   | M   | M    | M    | L    | -                                | -    | -    |
| CO4                                                                                                                                                                                                                                                                                                                               | L                                                              | L                 | L   | L   | M   | M   | M                        | S   | M   | M    | M    | L    | -                                | -    | -    |
| CO5                                                                                                                                                                                                                                                                                                                               | L                                                              | L                 | L   | L   | M   | M   | M                        | S   | M   | M    | M    | L    | -                                | -    | -    |
|                                                                                                                                                                                                                                                                                                                                   |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |
| UNIT-I                                                                                                                                                                                                                                                                                                                            | INTRODUCTION TO ENVIRONMENT AND ENVIRONMENTAL STUDIES          |                   |     |     |     |     | 9 Hours                  |     |     |      |      |      |                                  |      |      |
| 1.1. Introduction to environment – components – nature of environment – need of awareness– reasons for environmental problems – anthropocentric and eco centric views. 1.2. Environmental                                                                                                                                         |                                                                |                   |     |     |     |     |                          |     |     |      |      |      |                                  |      |      |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                |                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------|
| studies - multidisciplinary nature – scope and aim – sustainable development principles – RRR concept-Indian environmental movements–environmental calendar.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                |                 |
| <b>UNIT-II</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>ECO SYSTEM AND BIO DIVERSITY</b>                                                                            | <b>9 Hours</b>  |
| 2.1. Ecosystem – structure – functions – simplified ecosystem models (food chain and food webs and their types, energy flow) - forest – grassland – pond –ecosystems – ecological succession – ecological pyramids–Bio-geo chemical cycles of water–oxygen-carbon-phosphorous and sulphur. 2.2.Biodiversity – definition – types – species – genetic and ecosystem diversities-values of biodiversity – threats to biodiversity – conservation of biodiversity – endemism – biodiversity hotspots – Indian biodiversity– endemic species of India–IUCN lists – red – green and blue data books.                                                                                      |                                                                                                                |                 |
| <b>UNIT-III</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>NATURAL RESOURCES</b>                                                                                       | <b>9 Hours</b>  |
| 3.1 Natural resources – definition – types – forest resources – uses –deforestation- reasons - effects – water resources – dams – effects of dams - food resources – modern agriculture– ill effects – energy resources -types–hydel–nuclear–solar–wind and biomass energy-world scenario–Indian scenario. 3.2 Population and environment–reasons for over exploitation of resources–population–demography – population curves – population explosion – effects – consumerism – effects – urbanization – reasons and effects – role of an individual.                                                                                                                                |                                                                                                                |                 |
| <b>UNIT-IV</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>ENVIRONMENT POLLUTION</b>                                                                                   | <b>9 Hours</b>  |
| 4.1 Pollution–definition–types–air pollution –causes and effects–effects of CO <sub>2</sub> –CO – NO <sub>x</sub> – SO <sub>x</sub> –particulates–control of air pollution–water pollution–causes–effects–remedies–soil pollution– solid waste management – e-waste – ill effects of e-waste – proper recycling – Noise pollution – reasons–effects – control – nuclear pollution – cases – effects and control –thermal pollution causes – effects and remedies. 4.2 Legal provisions for protecting environment – article 48 A – 51 A (g) – Environment act1986 – Air act 1981 – Water act 1974 – wild life protection act – Forest act 1980 - problems in implementation–reasons. |                                                                                                                |                 |
| <b>UNIT-V</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>SOCIAL ISSUES AND ENVIRONMENTAL ETHICS</b>                                                                  | <b>9 Hours</b>  |
| Present environmental scenario – green house effect – climate change–The Kyoto Protocol–ozone layer depletion- The Montreal Protocol–acid rain–causes–effects–disparity among the nations– The Copenhagen UNFCCC summit – carbon currency- virtual water- genetically modified organisms, Disaster management. 5.2 Environmental ethics–introduction–people getting affected–resettlement and rehabilitation – issues involved –Sardhar Sarovar project – Tawa Matsya sang - Melting icebergs of Arctic.                                                                                                                                                                             |                                                                                                                |                 |
| <b>Total Hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                | <b>45 Hours</b> |
| <b>Text Book(s)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |                 |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Anubha Kaushik and C.P. Kaushik, "Prospects of Environmental Science", New Age International publishers, 2019. |                 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

| Reference Book(s) |                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------|
| 1.                | Environmental Studies, N.Nandini, N. Sunitha and SucharitaTandon, Sapna Book House, 2019.                           |
| 2.                | Text book of Environmental Science, Ragavan Nambiar, Scitech Publications, 2010.                                    |
| 3.                | Text book of Environmental Chemistry and Pollution Control, S.S.Dara, S.Chandand Co., 7 <sup>th</sup> Edition.      |
| 4.                | Environmental Chemistry, Colin Baird, W.H.Freemanand company, NewYork, 4 <sup>th</sup> Edition, 2008.               |
| 5.                | Environmental Chemistry, Gary W.VanLoon and StephenJ. Duffy, Oxford University Press, 9 <sup>th</sup> Edition 2017. |
| 6.                | New Trends in Green Chemistry, V.K. Ahluwalia and M. Kidwai, Anamaya Publishers, 1 <sup>st</sup> Edition 2012.      |





**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                | L                 | T    | P    | C    | IA    | EA                       | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | DESIGN THINKING                                                                                                                                                                                                | 2                 | 0    | 0    | 2    | 40    | 60                       | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | VOCATIONAL AND SKILL ENHANCEMENT COURSE -1                                                                                                                                                                     | Syllabus Revision |      |      |      | V.1.0 |                          |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Objectives:</b><br>1. To understand various learning process, understanding the problems and enhancement techniques on innovative engineering products.<br>2. To understand the importance of the design thinking tools.<br>3. To learn about the problem-solving techniques and gain the knowledge about Empathy methods.<br>4. To develop skills in ideation, product design tools and prototyping.<br>5. To develop skills in testing, innovations, and collaboration on novel products. |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Description                                                                                                                                                                                                    |                   |      |      |      |       | Highest Bloom's Taxonomy |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Classify the various learning principles and styles, memory technologies, and assess the emotional experience when examining emotional expressions in engineering education in order to create novel products. |                   |      |      |      |       | K2                       |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Discover the importance of brainstorming and how to apply design thinking tools to produce new products through innovative thinking.                                                                           |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Propose the suitable problem-solving techniques through different Empathy tools and methods on defining problem statement on new products.                                                                     |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Generate new ideation techniques applied on new product design and evaluate prototype effectiveness on different suitable developed prototype models.                                                          |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Apply diffusive and convective mass transfer equations and correlations to solve problems for different applications.                                                                                          |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Program Outcomes (POs)                                                                                                                                                                                         |                   |      |      |      |       |                          |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PO 1                                                                                                                                                                                                           | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | M                                                                                                                                                                                                              | L                 | L    | L    | -    | -     | -                        | -    | -    | -     | -     | -     | -                                | -     | -     |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|-------------|---|----------|--|
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M | M                                                            | L | L | - | - | - | - | - | - | - | - | L | M           |   |          |  |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | L | M                                                            | M | M | L | L | - | - | - | - | - | - | L | M           | M |          |  |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M | M                                                            | M | S | M | L | L | L | M | L | M | M | L | M           | L |          |  |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | M | M                                                            | M | M | - | M | - | L | M | M | - | M | L | L           | M |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| UNIT-I                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   | BASICS OF LEARNING, UNDERSTANDING AND ENHANCEMENT TECHINQUES |   |   |   |   |   |   |   |   |   |   |   | 9 Hours     |   |          |  |
| An Insight to Learning Process –Principles and Dimensions of Learning Process – Understanding the Problems– Learning Styles– Human Centered Design –Assessing and Interpreting– Remembering and Understanding the Memory process–Problems in Learning Retention process – Memory Enhancement Techniques –Emotions and Psychology –Applications of Peer Learning– Examples.                                                                                           |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   | DESIGN THINKING TOOLS                                        |   |   |   |   |   |   |   |   |   |   |   | 9 Hours     |   |          |  |
| Design Thinking process – Definition and Need of Design Thinking –Objectives and Features of Design Thinking–Concept of Brainstorming– Design Thinking Frameworks –Design Thinking Mindsets – Design Thinking Tools– Empathize, Define, Ideate, Prototype and Test–Applications of Design thinking.                                                                                                                                                                  |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| UNIT-III                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   | PROBLEM-SOLVING TECHNIQUES AND EMPATHYMAPING                 |   |   |   |   |   |   |   |   |   |   |   | 9 Hours     |   |          |  |
| Ingenious & Problem-Solving Understanding – Problem Solving & techniques – Role of Empathy – Methods and tools of Empathy – Defining the problem – Analysis and Synthesis – Empathy Mapping& its types – Customer journey mapping – Jobs-to-be-done concept– Point of View on Problem Statement.                                                                                                                                                                     |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| UNIT-IV                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   | IDEATION, PRODUCT DESIGN AND PROTOTYPING                     |   |   |   |   |   |   |   |   |   |   |   | 9 Hours     |   |          |  |
| Ideation methods – Principles of creativity & its methods–Brains torming techniques – Product design process –Process of Engineering Product design – Stages of Product design – Conceptual design – Examples of best product designs and functions – Assignment on Engineering Product Design – Prototype – Need of Prototype – Types of Prototype – Rapid Prototyping – Benefits of Prototyping.                                                                   |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| UNIT-V                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   | TESTING, INNOVATION AND COLLABORATION                        |   |   |   |   |   |   |   |   |   |   |   | 9 Hours     |   |          |  |
| Testing – Purpose of testing – Types of testing – Sample Examples – Test Group Marketing – Creative thinking process – Innovation – Needs of Innovation –Types of innovation – Characteristics of Innovation – Collaboration – Process, tools and techniques of collaboration – Importance of Collaborative design – steps involved in collaborative design– Benefits, challenges and applications of collaboration –Feedback – Re-Design & Re-Create Feedback loop. |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |                                                              |   |   |   |   |   |   |   |   |   |   |   | Total Hours |   | 45 Hours |  |
| Text Book(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |
| 1. Idris Mootee, Design thinking for strategic innovation, Wiley publications, 2013.                                                                                                                                                                                                                                                                                                                                                                                 |   |                                                              |   |   |   |   |   |   |   |   |   |   |   |             |   |          |  |



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

|                          |                                                                                                                                                                                                 |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.                       | Hasso Plattner, Christoph Meinel and Larry Leifer (eds), "Design Thinking: Understand – Improve – Apply", Springer, 2011.                                                                       |
| 3.                       | Michael Lewrick, Patrick Link, and Larry Leifer, The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems, 2018, John Wiley & Sons. |
| <b>Reference Book(s)</b> |                                                                                                                                                                                                 |
| 1.                       | Balaguruswamy, E., “Developing Thinking Skills (The Way to Success)”, Khanna Publisher, First Edition, January 2022.                                                                            |
| 2.                       | Tom Kelley, The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm, Currency/Doubleday, 2001                                                                     |
| 3.                       | Tim Brown, Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation, HarperCollins Publishers Ltd, 2009                                                           |
| 4.                       | Ulrich & Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004.                                                                                                              |
| 5.                       | Kevin Otto, Kristin Wood, Product Design: Techniques in Reverse Engineering and New Product Development, Pearson publications, 2001.                                                            |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                    | L                 | T    | P    | C    | IA    | EA                       | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IDEA LAB WORKSHOP                                                                                  | 0                 | 0    | 2    | 2    | 40    | 60                       | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | DO IT YOURSELF                                                                                     | Syllabus Revision |      |      |      | V.1.0 |                          |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Objectives:</b><br>The course should enable the students -<br><div><div>1.</div><div>To learn all the skills associated with the tools and inventory associated with the IDEA Lab.</div></div> <div><div>2.</div><div>Learn useful mechanical and electrical and electronic fabrication processes.</div></div> <div><div>3.</div><div>Learn necessary skills to build useful and standalone system/ project with enclosures.</div></div> <div><div>4.</div><div>Learn necessary skills to create print and electronic documentation for the system/ project.</div></div> |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Description                                                                                        |                   |      |      |      |       | Highest Bloom's Taxonomy |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Acquire knowledge in utilizing various tools, devices and machines used in engineering practice.   |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Understand different measuring instruments and safety standards                                    |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Analyze various operations in mechanical engineering workshop                                      |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Understand electronic system design flow, fabrication and testing of the circuits.                 |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Apply mechanical, electrical, and electronic fabrication processes to develop different prototypes |                   |      |      |      |       | K4                       |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Program Outcomes (POs)                                                                             |                   |      |      |      |       |                          |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PO 1                                                                                               | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                  | L                 | -    | -    | L    | -     | -                        | -    | -    | -     | -     | -     | L                                | M     | -     |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                  | -                 | -    | -    | M    | -     | -                        | -    | -    | -     | -     | -     | L                                | L     | -     |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                  | M                 | M    | L    | M    | -     | -                        | -    | -    | -     | -     | -     | L                                | L     | L     |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                  |                   | M    | M    | S    | -     | -                        | -    | -    | -     | M     | -     | M                                | M     | L     |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                  | L                 | M    |      | S    | -     | -                        | -    | M    | -     | S     | -     | M                                | M     | M     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Content Mechanical Engineering</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Introduction to basic hand tools:</b> Tape measure, combination square, Vernier caliper, hammers, fasteners, wrenches, pliers, saws, tube cutter, chisels, vice and clamps, tapping and threading. Adhesives                                                                                                                                                    |                                                                                                                                                                                                                                                           |
| <b>Introduction to Power tools:</b> Power saws, band saw, jigsaw, angle grinder, belt sander, bench grinder, rotary tools. Various types of drill bits.                                                                                                                                                                                                            |                                                                                                                                                                                                                                                           |
| <b>3D printing and prototyping technology:</b> 3D printing using FDM, SLS and SLA. Basics of 3D scanning, point cloud data generation for reverse engineering.                                                                                                                                                                                                     |                                                                                                                                                                                                                                                           |
| <b>Course Content ECE/EEE</b>                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                           |
| <b>Familiarization and use of basic measurement instruments:</b> DSO including various triggering modes, DSO probes, DMM, LCR bridge, Signal and function generator. Logic analyzer and MSO. Bench power supply (with 4-wire output).                                                                                                                              |                                                                                                                                                                                                                                                           |
| <b>Electrical Measurements:</b> use of multimeters- tong testers- continuity testing-use of contactors-push button switches-relays-fuses - electrical cabling tools-optical cable connectors.                                                                                                                                                                      |                                                                                                                                                                                                                                                           |
| <b>Electronic component familiarization:</b> Understanding electronic system design flow. Schematic design and PCB layout and Gerber creation using EagleCAD. Documentation using Doxygen, Google Docs, Overleaf. Version control tools - GIT and GitHub.                                                                                                          |                                                                                                                                                                                                                                                           |
| <b>Basic 2D and 3D designing</b> using CAD tools such as FreeCAD, Sketchup, Prusa Slicer, FlatCAM, Inkspace, OpenBSP and VeriCUT.                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                           |
| <b>Electronic circuit building blocks including common sensors:</b> Arduino and Raspberry Pi programming and use. Digital Input and output. Measuring time and events. PWM. Serial communication. Analog input. Interrupts programming. Power Supply design (Linear and Switching types), Wireless power supply, USB PD, Solar panels, Battery types and charging. |                                                                                                                                                                                                                                                           |
| <b>List of Lab activities and experiments (Department of Mechanical Engineering)</b>                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                           |
| 1.                                                                                                                                                                                                                                                                                                                                                                 | External thread cutting of bolts.                                                                                                                                                                                                                         |
| 2.                                                                                                                                                                                                                                                                                                                                                                 | Counter profile turning of wood using wooden lathe.                                                                                                                                                                                                       |
| 3.                                                                                                                                                                                                                                                                                                                                                                 | Conversion of square prism to cylinder using bosch router.                                                                                                                                                                                                |
| 4.                                                                                                                                                                                                                                                                                                                                                                 | Cutting of square profile using 2D profile cutting machine.                                                                                                                                                                                               |
| 5.                                                                                                                                                                                                                                                                                                                                                                 | Cutting of Hexogon profile using 2D profile cutting machine.                                                                                                                                                                                              |
| 6.                                                                                                                                                                                                                                                                                                                                                                 | Fabrication practice of Safety grill for window using welding technique.                                                                                                                                                                                  |
| 7.                                                                                                                                                                                                                                                                                                                                                                 | Fabrication practice of joining two similar metals using TIG Welding.                                                                                                                                                                                     |
| 8.                                                                                                                                                                                                                                                                                                                                                                 | Printing of Cube using 3D printer.                                                                                                                                                                                                                        |
| 9.                                                                                                                                                                                                                                                                                                                                                                 | Printing of Cylinder using 3D printer.                                                                                                                                                                                                                    |
| <b>List of Lab activities and experiments (Department of Electronics &amp; Communication Engineering)</b>                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                           |
| 1.                                                                                                                                                                                                                                                                                                                                                                 | Familiarization of Active and Passive components, Resistorcolor coding, Different types of capacitor, Bread boardconnection, CRO and Function Generator, Schematic design andPCB layout and Gerber creation using KICAD, Tinker CAD andDifferent sensors. |
| 2.                                                                                                                                                                                                                                                                                                                                                                 | Schematic and PCB Design Layout of Analog Electronic circuits using KICAD Tool.<br>1.Simple LED<br>2.Voltage Regulator<br>3.Power supply<br>4.Inverting Amplifier                                                                                         |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|    |                                                                                                                                                                                                                                        |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. | Schematic and PCB Design Layout of Different sensor modules using KICAD Tool.<br>1. Voltage Sensors (LDR)<br>2. Proximity sensor<br>3. IR sensor                                                                                       |
| 4. | (i). Interfacing a IR sensor with Arduino microcontroller.<br>(ii). Interfacing a Relay shield with Arduino microcontroller.<br>(iii). Interfacing a GSM (Global System for Mobile Communications) module with Arduino microcontroller |
| 5. | Familiarization of Raspberry PI and perform Necessary Software Installation.                                                                                                                                                           |
| 6. | Mini Project.                                                                                                                                                                                                                          |

**List of Lab activities and experiments (Department of Electrical & Electronics Engineering)**

|    |                                                                 |
|----|-----------------------------------------------------------------|
| 1. | Study of cathode ray oscilloscope/digital storage oscilloscope. |
| 2. | Study of Multimeter.                                            |
| 3. | Study of characteristics of the solar panel.                    |
| 4. | Study of Characteristic regulated power supply.                 |
| 5. | Measurement of ac power using clamp meter.                      |

**REFERENCE BOOKS:**

|     |                                                                                                                                                                                |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.  | <a href="#"><u>AICTE's Prescribed Textbook: Workshop / Manufacturing Practices (with Lab Manual), ISBN: 978-9391505332</u></a>                                                 |
| 2.  | All-in-One Electronics Simplified, A.K. Maini; 2021. ISBN-13: 978-9386173393, Khanna Book Publishing Company, New Delhi.                                                       |
| 3.  | Simplified Q&A - Data Science with Artificial Intelligence, Machine Learning and Deep Learning, Rajiv Chopra, ISBN: 978-9355380821, Khanna Book Publishing Company, New Delhi. |
| 4.  | 3D Printing & Design, Dr. Sabrie Soloman, ISBN: 978-9386173768, Khanna Book Publishing Company, New Delhi.                                                                     |
| 5.  | The Big Book of Maker Skills: Tools & Techniques for Building Great Tech Projects. Chris Hackett. Weldon Owen; 2018. ISBN-13: 978-1681884325.                                  |
| 6.  | The Total Inventors Manual (Popular Science): Transform Your Idea into a Top-Selling Product. Sean Michael Ragan (Author). Weldon Owen; 2017. ISBN-13: 978-1681881584.         |
| 7.  | Make: Tools: How They Work and How to Use Them. Platt, Charles. Shroff/Maker Media. 2018. ISBN-13: 978-9352137374                                                              |
| 8.  | The Art of Electronics. 3rd edition. Paul Horowitz and Winfield Hill. Cambridge University Press. ISBN: 9780521809269                                                          |
| 9.  | Practical Electronics for Inventors. 4th edition. Paul Sherz and Simon Monk. McGraw Hill. ISBN-13: 978-1259587542                                                              |
| 10. | Encyclopedia of Electronic Components (Volume 1, 2 and 3). Charles Platt. Shroff Publishers. ISBN-13: 978-9352131945, 978-9352131952, 978-9352133703                           |
| 11. | Building Scientific Apparatus. 4th edition. John H. Moore, Christopher C. Davis, Michael A. Coplan and Sandra C. Greer. Cambridge University Press. ISBN-13: 978-0521878586    |
| 12. | Programming Arduino: Getting Started with Sketches. 2nd edition. Simon Monk. McGraw Hill. ISBN-13: 978-1259641633                                                              |
| 13. | Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Boards. Simon Monk and Duncan Amos. McGraw Hill Education. ISBN-13 : 978-1260019193.                         |
| 14. | Pro GIT. 2nd edition. Scott Chacon and Ben Straub. A press. ISBN-13 : 978-1484200773                                                                                           |
| 15. | Venuvinod, PK., MA. W., Rapid Prototyping – Laser Based and Other Technologies,                                                                                                |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|     |                                                                                                                                                     |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Kluwer, 2004.                                                                                                                                       |
| 16. | Ian Gibson, David W Rosen, Brent Stucker., “Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing”, Springer, 2010 |
| 17. | Chapman W.A.J, “Workshop Technology”, Volume I, II, III, CBS Publishers and distributors, 5th Edition, 2002.                                        |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

**SEMESTER - II**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                    | L                 | T    | P    | C    | IA    | EA                       | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MATHEMATICS -II                                                                                                                                    | 3                 | 1    | 0    | 4    | 40    | 60                       | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | BASIC SCIENCE COURSE                                                                                                                               | Syllabus Revision |      |      |      | V.1.0 |                          |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Objectives:</b><br>The course should enable the students -<br>1. To equip students with techniques to solve ordinary differential equations using analytical and numerical methods.<br>2. To develop an understanding of partial differential equations and methods of finding their general and particular solutions.<br>3. To introduce Fourier series and their applications in representing periodic functions.<br>4. To familiarize students with Laplace transforms and their use in solving differential equations.<br>5. To provide a foundation in Fourier transforms and their properties for analyzing signals and systems. |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Description                                                                                                                                        |                   |      |      |      |       | Highest Bloom's Taxonomy |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Solve ordinary differential equations using analytical methods and numerical techniques such as Taylor's series, Runge-Kutta, and Milne's methods. |                   |      |      |      |       | K6                       |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Formulate and solve partial differential equations using appropriate methods including Charpit's method.                                           |                   |      |      |      |       | K6                       |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Represent periodic functions using Fourier series and apply them to solve engineering problems.                                                    |                   |      |      |      |       | K6                       |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Apply Laplace transforms and their properties to solve differential equations and evaluate integrals.                                              |                   |      |      |      |       | K6                       |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Use Fourier transforms to analyze signals and solve problems involving integral transforms.                                                        |                   |      |      |      |       | K6                       |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                    |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Program Outcomes (POs)                                                                                                                             |                   |      |      |      |       |                          |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | PO 1                                                                                                                                               | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O1                            | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | S                                                                                                                                                  | S                 | S    | S    | S    | M     | M                        | -    | M    | M     | M     | L     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | S                                                                                                                                                  | S                 | S    | S    | S    | M     | M                        | -    | M    | M     | M     | L     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | S                                                                                                                                                  | S                 | S    | S    | S    | M     | M                        | -    | M    | M     | M     | L     | -                                | -     | -     |





**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|----------|---|---|
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                      | S                                                                                                                | S | S | S | S | M | M | - | M | M | M | L | -        | - | - |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                      | S                                                                                                                | S | S | S | S | M | M | - | M | M | M | L | -        | - | - |
|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| UNIT-I                                                                                                                                                                                                                                                                                                                                                                                                                                   | Differential Equations                                                                                           |   |   |   |   |   |   |   |   |   |   |   | 12 Hours |   |   |
| Method of variation of parameters - Equations reducible to linear equations with constant coefficients: Cauchy's homogeneous linear equation- solving of Ordinary differential equations using Numerical methods: Taylor's series, Runge-Kutta method of fourth order for solving first order equations - Milne's predictor corrector methods.                                                                                           |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| UNIT-II                                                                                                                                                                                                                                                                                                                                                                                                                                  | Partial Differential Equations                                                                                   |   |   |   |   |   |   |   |   |   |   |   | 12 Hours |   |   |
| Formation of partial differential equations – Solution of a partial differential equation – Equations solvable by direct integration – Linear equations of first order – Non linear equations of the first order – Charpit's method - Homogeneous linear equations with constant coefficients –Rules for finding complementary functions – Rules for finding particular integral – Solution of homogeneous linear equation of any order. |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| UNIT-III                                                                                                                                                                                                                                                                                                                                                                                                                                 | Fourier series                                                                                                   |   |   |   |   |   |   |   |   |   |   |   | 12 Hours |   |   |
| Introduction- Euler's Formulae- Conditions for a Fourier expansion - Functions having points of discontinuity - Change of interval - Odd and even function-Expansions of odd or even periodic functions - Half-range series - Typical wave-forms - Parseval's formula.                                                                                                                                                                   |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| UNIT-IV                                                                                                                                                                                                                                                                                                                                                                                                                                  | Laplace Transforms                                                                                               |   |   |   |   |   |   |   |   |   |   |   | 12 Hours |   |   |
| Definition, Properties of Laplace transforms: Linearity Property, First shifting property, Change of scale property – Transforms of derivatives - Transforms of integrals - Multiplication by $t^n$ - Division by $t$ - Evaluation of integrals by Laplace transform - Inverse transforms: Method of partial fractions – Other methods of finding inverse - Convolution theorem (without proof) Application to differential equations    |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| UNIT-V                                                                                                                                                                                                                                                                                                                                                                                                                                   | Fourier Transforms                                                                                               |   |   |   |   |   |   |   |   |   |   |   | 12 Hours |   |   |
| Fourier integral theorem (without proof) - Fourier Sine and Cosine integrals – Complex form of Fourier integral - Fourier transform – Fourier sine and Cosine transforms – Properties of Fourier Transforms: Linear property, Change of scale property, Shifting property -Parseval's identity for Fourier transforms (without proof)                                                                                                    |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| Total Hours                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   | 60 Hours |   |   |
| Text Book(s)                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                                       | B.S. Grewal, Higher Engineering Mathematics, 42 <sup>nd</sup> Edition, Khanna Publishers.                        |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| Reference Book(s)                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                        | Coddington, E. A, An Introduction to Ordinary Differential Equations. United Kingdom: Dover Publication. (2012). |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                        | Simmons, G. F. Differential Equations: With Applications and Historical Notes. India: Tata McGraw-Hill. (2003)   |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                        | John, F. Partial Differential Equations. Germany: Springer New York(2013)                                        |   |   |   |   |   |   |   |   |   |   |   |          |   |   |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                        | Evans, L. C. Partial Differential Equations. United States: American Mathematical Society(2022)                  |   |   |   |   |   |   |   |   |   |   |   |          |   |   |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|------|------|------|--------------------------|---------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                     |                                                                                                                                                 | L                                        | T    | P    | C    | IA   | EA                       | TM      |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                     | ENGINEERING CHEMISTRY                                                                                                                           | 3                                        | 0    | 0    | 3    | 40   | 60                       | 100     |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                 | BASIC SCIENCE COURSE                                                                                                                            | Syllabus Revision                        |      |      |      |      | V.1.0                    |         |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                   |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Objectives:<br>The course should enable the students<br>1.To learn the basics of atomic structure, bonding and analytical methods<br>2. To learn various types of reactions in organic chemistry                                                                                         |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Outcomes:<br>On completion of the course, the student will be able to                                                                                                                                                                                                                    |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                 | Description                                                                                                                                     |                                          |      |      |      |      | Highest Bloom's Taxonomy |         |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                             | Analyze microscopic chemistry in terms of atomic and molecular orbital's and intermolecular forces.                                             |                                          |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                             | Rationalize bulk properties and processes using thermodynamic considerations.                                                                   |                                          |      |      |      |      | K4                       |         |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                             | Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques. |                                          |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                             | Rationalize periodic properties.                                                                                                                |                                          |      |      |      |      | K4                       |         |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                             | List major chemical reactions that are used in the synthesis of various organic molecules.                                                      |                                          |      |      |      |      | K4                       |         |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Correlation between Course Outcomes (COs) and Program Outcomes (POs):                                                                                                                                                                                                                           |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                             | Program Outcomes (POs)                                                                                                                          |                                          |      |      |      |      |                          |         |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                 | PO 1                                                                                                                                            | PO 2                                     | PO 3 | PO 4 | PO 5 | PO 6 | PO 7                     | PO 8    | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                             | S                                                                                                                                               | S                                        | M    | M    | L    | M    | M                        | -       | M    | M     | M     | M     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                                             | S                                                                                                                                               | S                                        | M    | M    | L    | M    | M                        | -       | M    | M     | M     | M     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                                             | S                                                                                                                                               | S                                        | M    | M    | M    | M    | M                        | -       | M    | M     | M     | M     | -                                | -     | -     |
| CO4                                                                                                                                                                                                                                                                                             | S                                                                                                                                               | S                                        | M    | M    | M    | M    | M                        | -       | M    | M     | M     | M     | -                                | -     | -     |
| CO5                                                                                                                                                                                                                                                                                             | S                                                                                                                                               | S                                        | M    | M    | L    | M    | M                        | -       | M    | M     | M     | M     | -                                | -     | -     |
|                                                                                                                                                                                                                                                                                                 |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| UNIT-I                                                                                                                                                                                                                                                                                          |                                                                                                                                                 | Molecular Engineering and Nanotechnology |      |      |      |      |                          | 9 Hours |      |       |       |       |                                  |       |       |
| Review of chemical bonding - MO theory – formation of H2,He2,O2,N2,CO and HF – hybridization definition- CH4,C2H4 and C2H2 - Supramolecular chemistry definition – types of molecular assemblies - molecular machines (concepts only) – Nanomaterials-differences between bulk and nanophases - |                                                                                                                                                 |                                          |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                    |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------|
| synthesis (top-down and bottom-up) - Applications: sensors, energy devices, coatings .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                    |                 |
| <b>UNIT-II</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Engineering Materials – Polymers, Ceramics &amp; Composites</b> | <b>9 Hours</b>  |
| Polymers – introduction – types - advanced functional polymers -conducting polymers - biodegradable plastics – PLA and cellulose derivatives - Engineering ceramics – properties – types – oxide (Alumina and zirconia) non-oxide (SiC) and composite ceramics (metal cements) - applications - Composite materials: classification and uses.                                                                                                                                                                                                                                       |                                                                    |                 |
| <b>UNIT-III</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Electrochemistry and Corrosion Control</b>                      | <b>9 Hours</b>  |
| Electrodes – types of electrodes – SEP – Nernst equation -Electrochemical cells, EMF, Nernst equation for cells -Batteries- Ni-Cd and Li-ion batteries - supercapacitors – introduction only - fuel cells introduction and types - Corrosion: types of corrosion - mechanisms, protection strategies.                                                                                                                                                                                                                                                                               |                                                                    |                 |
| <b>UNIT-IV</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Water treatment technology</b>                                  | <b>9 Hours</b>  |
| Water as universal solvent – hardness-types - units of hardness -estimation of hardness - disadvantages of hard water – scale and sludges – water softening methods - ion exchange method, RO methods - Wastewater treatment: primary to tertiary methods - water pollutants types- heavy metals, microplastics and pesticide residues – effects. Domestic water treatment.                                                                                                                                                                                                         |                                                                    |                 |
| <b>UNIT-V</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Introduction to Green Chemistry</b>                             | <b>9 Hours</b>  |
| Introduction to Green Chemistry – definition, scope, and significance - Twelve Principles of Green Chemistry – Atom Economy – definition, calculation, and applications, Carbon Footprint and Water Footprint – concepts and relevance in chemical industries -LCA – introduction- importance- Green Synthetic Methodologies – use of green solvents, supercritical fluids, and ionic liquids - SolventFree Reactions – techniques and advantages - Microwave-Assisted and Sonochemical Reactions – principles, mechanisms, and applications                                        |                                                                    |                 |
| <b>LIST OF EXPERIMENTS FOR LABORATORY COURSE [Any 8]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                    |                 |
| 1. Kinetics of Green synthesis of silver nanoparticles -Colorimetry<br>2. Determination of hardness of water (EDTA method)<br>3. Estimation of DO of water samples<br>4. Estimation of COD of water samples<br>5. Verification of Nernst equation for an electrode<br>6. Electrochemical cell construction and EMF measurement<br>7. Corrosion studies of metals<br>8. Prediction of Feasibility of cells<br>9. Bioplastic preparation and testing<br>10. Ion exchange water purification<br>11. Greensynthesis of bis-naphthol<br>12. Air particulate analysis using filter method |                                                                    |                 |
| <b>Total Hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                    | <b>45 Hours</b> |
| <b>Text Book(s)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                    |                 |



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

|                          |                                                                                  |
|--------------------------|----------------------------------------------------------------------------------|
| 1.                       | Jain & Jain, Engineering Chemistry, Dhanpat Rai Publishing, Latest Edition.      |
| <b>Reference Book(s)</b> |                                                                                  |
| 1.                       | P.C. Jain & Monika Jain, Engineering Chemistry, Dhanpat Rai Publishing.          |
| 2.                       | Shashi Chawla, A Textbook of Engineering Chemistry, Dhanpat Rai & Co.            |
| 3.                       | S.S. Dara & S.S. Umare, Engineering Chemistry, S. Chand & Company.               |
| 4.                       | R. Mukhopadhyay, Advanced Engineering Chemistry, New Age International.          |
| 5.                       | Anastas & Warner, Green Chemistry: Theory and Practice, Oxford University Press. |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------|------|------|------|------|--------------------------|---------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                        | L                 | T    | P    | C    | IA   | EA                       | TM      |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | BASIC ELECTRICAL ENGINEERING                                                           | 2                 | 1    | 0    | 3    | 40   | 60                       | 100     |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ENGINEERING SCIENCE COURSE                                                             | Syllabus Revision |      |      |      |      | V.1.0                    |         |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Objectives:<br>The course should enable the students -<br><div><div>1. This course equips students to have basic knowledge and understanding in solving algebraic, transcendental equation numerically.</div><div>2. To make the student knowledgeable in the area of matrix theory so that he/she will be familiar in MATLAB applications.</div><div>3. To familiarize the student with functions of several variables. This is needed in many branches of Engineering.</div></div> |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Outcomes:<br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Description                                                                            |                   |      |      |      |      | Highest Bloom's Taxonomy |         |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Explain the basic electrical quantities and laws.                                      |                   |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Explain construction, types and applications of electrical machines.                   |                   |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Study the working principles of power converters.                                      |                   |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Show the tariff or a given load and energy consumption.                                |                   |      |      |      |      | K2                       |         |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Introduce the components of low voltage electrical installations and its applications. |                   |      |      |      |      | K3                       |         |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| Correlation between Course Outcomes (COs) and Program Outcomes (POs):                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Program Outcomes (POs)                                                                 |                   |      |      |      |      |                          |         |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | PO 1                                                                                   | PO 2              | PO 3 | PO 4 | PO 5 | PO 6 | PO 7                     | PO 8    | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | S                                                                                      | S                 | L    | L    | M    | M    | M                        | -       | S    | M     | -     | S     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | S                                                                                      | S                 | M    | M    | M    | S    | M                        | L       | S    | M     | L     | M     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | S                                                                                      | S                 | M    | M    | S    | M    | M                        | -       | M    | M     | -     | M     | -                                | -     | -     |
| CO4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | S                                                                                      | S                 | S    | S    | S    | M    | M                        | M       | M    | M     | L     | M     | -                                | -     | -     |
| CO5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | S                                                                                      | S                 | M    | S    | M    | M    | L                        | L       | S    | M     | L     | M     | -                                | -     | -     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |
| UNIT-I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                        | DC CIRCUITS       |      |      |      |      |                          | 9 Hours |      |       |       |       |                                  |       |       |
| Electrical circuit elements (R, L and C), voltage and current sources, Kirchoff current and voltage laws, analysis of simple circuits with dc excitation. Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-order RL and RC circuits.                                                                                                                                                                                                                              |                                                                                        |                   |      |      |      |      |                          |         |      |       |       |       |                                  |       |       |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                          |                                                      |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------|-----------------|
| <b>UNIT-II</b>                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                          | <b>AC CIRCUITS</b>                                   | <b>9 Hours</b>  |
| Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections.                                                      |                                                                                          |                                                      |                 |
| <b>UNIT-III</b>                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                          | <b>TRANSFORMERS</b>                                  | <b>9 Hours</b>  |
| Magnetic materials, BH characteristics, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.                                                                                                                                                                                                             |                                                                                          |                                                      |                 |
| <b>UNIT-IV</b>                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                          | <b>ELECTRICAL MACHINES</b>                           | <b>9 Hours</b>  |
| Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic. Loss components and efficiency, starting and speed control of induction motor. Single-phase induction motor. Construction, working, torque- speed characteristic and speed control of separately excited dc motor. Construction and working of synchronous generators. |                                                                                          |                                                      |                 |
| <b>UNIT-V</b>                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                          | <b>POWER CONVERTERS AND ELECTRICAL INSTALLATIONS</b> | <b>9 Hours</b>  |
| DC-DC buck and boost converters, duty ratio control. Single-phase and three-phase voltage source inverters; sinusoidal modulation. Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption, power factor improvement and battery backup.               |                                                                                          |                                                      |                 |
| <b>Total Hours</b>                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                          |                                                      | <b>45 Hours</b> |
| <b>Text Book(s)</b>                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                          |                                                      |                 |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                    | D. P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010. |                                                      |                 |
| 2.                                                                                                                                                                                                                                                                                                                                                                                                                    | D. C. Kulshreshtha, “Basic Electrical Engineering”, McGraw Hill, 2009.                   |                                                      |                 |
| <b>Reference Book(s)</b>                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                          |                                                      |                 |
| 1.                                                                                                                                                                                                                                                                                                                                                                                                                    | L. S. Bobrow, “Fundamentals of Electrical Engineering”, Oxford University Press, 2011.   |                                                      |                 |
| 2.                                                                                                                                                                                                                                                                                                                                                                                                                    | E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010.                       |                                                      |                 |
| 3.                                                                                                                                                                                                                                                                                                                                                                                                                    | V. D. Toro, “Electrical Engineering Fundamentals”, Prentice Hall India, 1989.            |                                                      |                 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                               |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|---------|------|-------|-------|-------|----------------------------------|-------|------|
| Course Code                                                                                                                                                                                                                   |                                                                                                                                                                                    | L                 | T    | P    | C    | IA    | EA                       | TM      |      |       |       |       |                                  |       |      |
| Course Name                                                                                                                                                                                                                   | PROGRAMMING FOR PROBLEM SOLVING                                                                                                                                                    | 3                 | 0    | 0    | 2    | 40    | 60                       | 100     |      |       |       |       |                                  |       |      |
| Course Category                                                                                                                                                                                                               | ENGINEERING SCIENCE COURSE                                                                                                                                                         | Syllabus Revision |      |      |      | V.1.0 |                          |         |      |       |       |       |                                  |       |      |
| Pre-requisite                                                                                                                                                                                                                 |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| <b>Course Objectives:</b><br>The course should enable the students -<br>1. Exposed to the syntax of C.<br>2. Familiar with programming in C.<br>3. To learn arrays, strings, functions, pointers, structures and unions in C. |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
|                                                                                                                                                                                                                               |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                           |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| Course Outcomes                                                                                                                                                                                                               | Description                                                                                                                                                                        |                   |      |      |      |       | Highest Bloom's Taxonomy |         |      |       |       |       |                                  |       |      |
| CO1                                                                                                                                                                                                                           | Develop algorithms for solving simple mathematical and engineering problems and examine the suitability of appropriate repetition and or selection structures for given problems.  |                   |      |      |      |       | K3                       |         |      |       |       |       |                                  |       |      |
| CO2                                                                                                                                                                                                                           | Solve matrix problems, merging, searching, sorting and string Manipulation problems using iteration, modularization or recursion as applicable.                                    |                   |      |      |      |       | K3                       |         |      |       |       |       |                                  |       |      |
| CO3                                                                                                                                                                                                                           | Organize files to perform text operations like editing, pattern Searching using structures.                                                                                        |                   |      |      |      |       | K3                       |         |      |       |       |       |                                  |       |      |
| CO4                                                                                                                                                                                                                           | Implement the algorithms for matrix problems, merging, searching, sorting, and string manipulation and file problems and debug and test using any procedural programming language. |                   |      |      |      |       | K3                       |         |      |       |       |       |                                  |       |      |
|                                                                                                                                                                                                                               |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                  |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| COs                                                                                                                                                                                                                           | Program Outcomes (POs)                                                                                                                                                             |                   |      |      |      |       |                          |         |      |       |       |       | Program Specific Outcomes (PSOs) |       |      |
|                                                                                                                                                                                                                               | PO 1                                                                                                                                                                               | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8    | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1                            | PSO 2 | PSO3 |
| CO1                                                                                                                                                                                                                           | S                                                                                                                                                                                  | S                 | S    | S    | S    | M     | L                        | L       | M    | M     | -     | M     | -                                | -     | -    |
| CO2                                                                                                                                                                                                                           | S                                                                                                                                                                                  | S                 | S    | S    | S    | M     | L                        | L       | M    | M     | -     | M     | -                                | -     | -    |
| CO3                                                                                                                                                                                                                           | S                                                                                                                                                                                  | S                 | M    | M    | S    | M     | L                        | L       | M    | M     | -     | M     | -                                | -     | -    |
| CO4                                                                                                                                                                                                                           | S                                                                                                                                                                                  | S                 | S    | S    | S    | M     | L                        | L       | S    | S     | -     | S     | -                                | -     | -    |
|                                                                                                                                                                                                                               |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |
| UNIT-I                                                                                                                                                                                                                        |                                                                                                                                                                                    | Module - I        |      |      |      |       |                          | 9 Hours |      |       |       |       |                                  |       |      |
| Introduction to components of computer system-Generation of programming languages-Types of                                                                                                                                    |                                                                                                                                                                                    |                   |      |      |      |       |                          |         |      |       |       |       |                                  |       |      |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                     |                                                                                                                         |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------|
| Computers-Organization of Computers-Types of memory, Number systems- Idea of Algorithm-Pseudo code- Flow Chart with examples.                                       |                                                                                                                         |          |
|                                                                                                                                                                     |                                                                                                                         |          |
| UNIT-II                                                                                                                                                             | Module - II                                                                                                             | 9 Hours  |
| Introduction to C-Character set, Constants, Variables, Data Types-Operators – Arithmetic expressions and precedence-Decision Making statement - Looping statements. |                                                                                                                         |          |
|                                                                                                                                                                     |                                                                                                                         |          |
| UNIT-III                                                                                                                                                            | Module - III                                                                                                            | 9 Hours  |
| Arrays and its types-Functions –Parameter passing in functions-call by value- call by reference Passing array to functions-Recursive function.                      |                                                                                                                         |          |
|                                                                                                                                                                     |                                                                                                                         |          |
| UNIT-IV                                                                                                                                                             | Module - IV                                                                                                             | 9 Hours  |
| Structures and array of structures –Union, Basic searching –Linear and Binary, Basic sorting, String operations.                                                    |                                                                                                                         |          |
|                                                                                                                                                                     |                                                                                                                         |          |
| UNIT-V                                                                                                                                                              | Module - V                                                                                                              | 9 Hours  |
| Introduction to Pointer, Pointer arithmetic-notion of linked list (no implementation) - File handling.                                                              |                                                                                                                         |          |
| Total Hours                                                                                                                                                         |                                                                                                                         | 45 Hours |
| Text Book(s)                                                                                                                                                        |                                                                                                                         |          |
| 1.                                                                                                                                                                  | Byron Gottfried, Schaum’s Outline of Programming with C, McGraw-Hill.                                                   |          |
| 2.                                                                                                                                                                  | Balagurusamy. E, “Programming in ANSI C”, Tata McGraw Hill, Third edition, 2006.                                        |          |
| 3.                                                                                                                                                                  | Fundamentals of Computing and Programming- V.RameshBabu, R.Samyuktha, M.Muniratham by VRB Publishers 2012 edition.      |          |
|                                                                                                                                                                     |                                                                                                                         |          |
| Reference Book(s)                                                                                                                                                   |                                                                                                                         |          |
| 1.                                                                                                                                                                  | Let Us 'C' – Yashawant Kanetkar, (Unit 2 to 5), BPB publications, 10th Edition, 2010.                                   |          |
| 2.                                                                                                                                                                  | Ashok N Kamthane, “Computer Programming”, Pearson education, Second Impression.                                         |          |
| 3.                                                                                                                                                                  | Kernighan Venugopal.K and Kavichithra.C, “Computer Programming”, New Age International Publishers, First Edition, 2007. |          |
| 4.                                                                                                                                                                  | B.W and Ritchie,D.M , The C programming language: second edition, Pearson education,2006.                               |          |





**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                      |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|--------------------------|------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                          |                                                                                                                                                                                              | L                 | T    | P    | C    | IA                       | EA   | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                          | ENGINEERING GRAPHICS AND DESIGN [THEORY & PRACTICAL]                                                                                                                                         | 2                 | 0    | 1    | 3    | 40                       | 60   | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                      | ENGINEERING SCIENCE COURSE                                                                                                                                                                   | Syllabus Revision |      |      |      | V.1.0                    |      |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                        |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Objectives:<br>The course should enable the students<br>1. To develop in students, graphic skills for communication of concepts, ideas and design of engineering products.<br>2. To expose them to existing national standards related to technical drawings. |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                      |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Outcomes:<br>On completion of the course, the student will be able to                                                                                                                                                                                         |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                      | Description                                                                                                                                                                                  |                   |      |      |      | Highest Bloom's Taxonomy |      |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                  | Draw orthographic projections of lines, planes and solids.                                                                                                                                   |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                  | Draw projections of solids including cylinder, prism and pyramid.                                                                                                                            |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                  | Draw section of solids including cylinder, prisms and pyramids.                                                                                                                              |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                  | Draw the development of surfaces including cylinder, Pyramid and prism.                                                                                                                      |                   |      |      |      | K4                       |      |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                  | Draw projection of lines, planes, solids, orthographic, projection, Isometric projection, and section of solids including cylinder, cone, prism, pyramid and building drawing using AutoCAD. |                   |      |      |      | K6                       |      |      |      |       |       |       |                                  |       |       |
|                                                                                                                                                                                                                                                                      |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Correlation between Course Outcomes (COs) and Program Outcomes (POs):                                                                                                                                                                                                |                                                                                                                                                                                              |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                  | Program Outcomes (POs)                                                                                                                                                                       |                   |      |      |      |                          |      |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                      | PO 1                                                                                                                                                                                         | PO 2              | PO 3 | PO 4 | PO 5 | PO 6                     | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                  | S                                                                                                                                                                                            | S                 | S    | S    | S    | M                        | M    | -    | M    | M     | M     | L     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                  | S                                                                                                                                                                                            | S                 | S    | S    | S    | M                        | M    | -    | M    | M     | M     | L     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                  | S                                                                                                                                                                                            | S                 | S    | S    | S    | M                        | M    | -    | M    | L     | M     | L     | -                                | -     | -     |
| CO4                                                                                                                                                                                                                                                                  | S                                                                                                                                                                                            | S                 | S    | S    | S    | M                        | M    | -    | M    | M     | M     | L     | -                                | -     | -     |
| CO5                                                                                                                                                                                                                                                                  | S                                                                                                                                                                                            | S                 | S    | S    | S    | L                        | M    | -    | M    | L     | M     | L     | -                                | -     | -     |



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Traditional Engineering Graphics:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Principles of engineering Graphics; Orthographic Projection; Descriptive Geometry; Drawing Principles; Isometric Projection; Surface Development; Perspective; Reading a Drawing;. Sectional Views; Dimensioning & Tolerances; True Length, Angle; intersection, Shortest Distance.                                                                                                                                                                                                                                                                                                              |
| <b>Computer Graphics:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Engineering Graphics Software; -Spatial Transformations; Orthographic Projections; Model Viewing; Co-ordinate Systems; Multi-view Projection; Exploded Assembly; Model Viewing; Animation; Spatial Manipulation; Surface Modeling; Solid Modeling; Introduction to Building Information Modeling (BIM).                                                                                                                                                                                                                                                                                          |
| <b>(Except the basic essential concepts, most of the teaching part can happen Concurrently in the laboratory)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Module 1: Introduction to Engineering Drawing</b> covering, Principles of Engineering Graphics and their significance, usage of Drawing instruments, lettering, Conic sections including the Rectangular Hyperbola (General method only); Cycloid, Epicycloids, Hypocycloid and In volute; Scales – Plain, Diagonal and Vernier Scales                                                                                                                                                                                                                                                        |
| <b>Module 2: Orthographic Projections</b> covering, Principles of Orthographic Projections- Conventions - Projections of Points and lines inclined to both planes; Projections of planes inclined Planes - Auxiliary Planes                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module 3: Projections of Regular Solids</b> covering, those inclined to both the Planes- Auxiliary Views; Draw simple annotation, dimensioning and scale. Floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.                                                                                                                                                                                                                                                                                                                                         |
| <b>Module 4: Sections and Sectional Views of Right Angular Solids</b> covering, Prism, Cylinder, Pyramid, Cone - Auxiliary Views; Development of surfaces of Right Regular Solids, Prism, Pyramid, Cylinder and Cone; Draw the sectional orthographic views of geometrical solids, objects from industry and dwellings (foundation to slab only)                                                                                                                                                                                                                                                 |
| <b>Module 5: Isometric Projections</b> covering, Principles of Isometric projection – Isometric Scale, Isometric Views, Conventions; Isometric Views of lines, Planes, Simple and compound Solids; Conversion of Isometric Views to Orthographic Views and Vice-versa, Conventions.                                                                                                                                                                                                                                                                                                              |
| <b>Module 6: Overview of Computer Graphics</b> covering, listing the computer technologies that impact on graphical communication, Demonstrating knowledge of the theory of CAD software [such as: The Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), The Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD, Select and erase objects.; Isometric Views of lines, Planes, Simple and compound Solids |
| <b>Module 7: Customization &amp; CAD Drawing</b> consisting of set up of the drawing page and the printer, including scale settings, Setting up of units and drawing limits; ISO and ANSI standards for coordinate dimensioning and tolerance; Orthographic constraints, Snap to objects manually and automatically; Producing drawings by using various coordinate input entry methods to draw straight lines, Applying various ways of drawing circles                                                                                                                                         |
| <b>Module 8: Annotations, layering &amp; other functions</b> covering applying dimensions to objects,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |



**Syllabus (2025-26)**  
**B.E. (Electronics and Communication Engineering)**

applying annotations to drawings; Setting up and use of Layers, layers to create drawings, Create, edit and use customized layers; Changing line lengths through modifying existing lines (extend/lengthen); Printing documents to paper using the print command; orthographic projection techniques; Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface; Drawing annotation, Computer-aided design (CAD) software modeling of parts and assemblies. Parametric and non-parametric solid, surface, and wireframe models. Part editing and two-dimensional documentation of models. Planar projection theory, including sketching of perspective, isometric, multi view, auxiliary, and section views. Spatial visualization exercises. Dimensioning guidelines, tolerance techniques; dimensioning and scale multi views of dwelling

**Module 9: Demonstration of a simple team design project that illustrates** Geometry and topology of engineered components: creation of engineering models and their presentation in standard 2D blueprint form and as 3D wire-frame and shaded solids; meshed topologies for engineering analysis and tool-path generation for component manufacture; geometric dimensioning and tolerancing; Use of solid-modeling software for creating associative models at the component and assembly levels; floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc. Applying color coding according to building drawing practice; Drawing sectional elevation showing foundation to ceiling; Introduction to Building Information Modeling (BIM).

|                     |                                                                                                |                    |                 |
|---------------------|------------------------------------------------------------------------------------------------|--------------------|-----------------|
|                     |                                                                                                | <b>Total Hours</b> | <b>45 Hours</b> |
| <b>Text Book(s)</b> |                                                                                                |                    |                 |
| 1.                  | Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House. |                    |                 |
| 2.                  | Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education.   |                    |                 |
| 3.                  | Agrawal B. & Agrawal C.M. (2012), Engineering Graphics: TMH Publication.                       |                    |                 |
| 4.                  | Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, SciTech Publishers.      |                    |                 |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                     |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                         |                                                                                                                                                | L                 | T    | P    | C    | IA    | EA                       | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                         | BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB                                                                                                 | 0                 | 0    | 2    | 2    | 40    | 60                       | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                     | ENGINEERING SCIENCE COURSE                                                                                                                     | Syllabus Revision |      |      |      | V.1.0 |                          |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                       |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Objectives:<br>The course should enable the students                                                                         |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 1. This course equips students to have basic knowledge and understanding in solving algebraic, transcendental equation numerically. |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 2. To make the student knowledge able in the area of matrix theory so that he /she will be familiar in Matlab applications.         |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 3. To familiarize the student with functions of several variables. This is needed in many branches of engineering.                  |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|                                                                                                                                     |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes:<br>On completion of the course, the student will be able to                                                        |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                     | Description                                                                                                                                    |                   |      |      |      |       | Highest Bloom's Taxonomy |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                 | Obtain load characteristics of Single Phase Induction Motor, Three Phase Induction Motor, Single Phase Transformer and Three Phase Alternator. |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                 | Obtain Speed Control of DC Motor, Three Phase Induction Motor (Pole Changing Method).                                                          |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                 | To demonstrate the working of Multi meter, CRO and LCR Meter and Measurement of Voltage, Current and Power.                                    |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                 | To Verify experimentally Kirchhoff's Law and Thevenin's Theorem.                                                                               |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                 | Obtain the B - H Curve of a Magnetic Material.                                                                                                 |                   |      |      |      |       | K4                       |      |      |       |       |       |                                  |       |       |
|                                                                                                                                     |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Correlation between Course Outcomes (COs) and Program Outcomes (POs):                                                               |                                                                                                                                                |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                 | Program Outcomes (POs)                                                                                                                         |                   |      |      |      |       |                          |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                     | PO 1                                                                                                                                           | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                 | S                                                                                                                                              | M                 | M    | M    | M    | M     | -                        | -    | S    | M     | -     | L     | -                                | -     | -     |
| CO2                                                                                                                                 | S                                                                                                                                              | S                 | M    | M    | S    | M     | L                        | -    | S    | S     | -     | M     | -                                | -     | -     |
| CO3                                                                                                                                 | S                                                                                                                                              | S                 | M    | M    | S    | M     | L                        | -    | S    | M     | L     | M     | -                                | -     | -     |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|
| <b>CO4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | S | S | S | S | M | M | L | L | M | M | - | S | - | -               | - |
| <b>CO5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | M | M | M | S | M | M | L | - | M | M | - | M | - | -               | - |
| <b>List of Experiments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |
| 1. Study of Electric Motors (AC & DC Motors)<br>2. Load Test on Single Phase Induction Motor<br>3. Load Test on Three Phase Induction Motor<br>4. Load Test on Single Phase Transformer<br>5. Load Test on Three Phase Alternator<br>6. Speed Control of DC Motor<br>7. Speed Control of Three Phase Induction Motor (Pole Changing Method)<br>8. Study of Multi meter, CRO and LCR Meter<br>9. Measurement of Voltage, Current and Power.<br>10. Verification of Kirchoff's Law<br>11. Verification of Thevenin's Theorem<br>12. B·H Curve of a Magnetic Material<br>13. Rectifier Circuit Analysis (AC – DC)<br>14. Inverter Circuit Analysis (DC – AC)<br>15. Chopper Circuit Analysis (DC – DC)<br>16. Series and Parallel RLC Circuit Analysis |   |   |   |   |   |   |   |   |   |   |   |   |   |                 |   |
| <b>Total Hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |   |   |   |   |   |   |   |   |   |   |   |   | <b>45 Hours</b> |   |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                          |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------|------|------|--------------------------|------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                              |                                                                                                                                                                                    | L                 | T    | P    | C    | IA                       | EA   | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                              | PROGRAMMING FOR PROBLEM SOLVING LABORATORY                                                                                                                                         | 0                 | 0    | 2    | 2    | 40                       | 60   | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                          | ENGINEERING SCIENCE COURSE                                                                                                                                                         | Syllabus Revision |      |      |      | V.1.0                    |      |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                            |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Objectives:                                                       |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| The course should enable the students                                    |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| 1. To get a clear understanding of Programming Concepts of ‘C’ language. |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
|                                                                          |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Outcomes:                                                         |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| On completion of the course, the student will be able to                 |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                          | Description                                                                                                                                                                        |                   |      |      |      | Highest Bloom's Taxonomy |      |      |      |       |       |       |                                  |       |       |
| CO1                                                                      | Develop algorithms for solving simple mathematical and engineering problems and examine the suitability of appropriate repetition and/or selection structures for given problems.  |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO2                                                                      | Solve matrix problems, merging, searching, sorting and string Manipulation problems using iteration, modularization or recursion as applicable.                                    |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO3                                                                      | Organize files to perform text operations like editing, pattern searching using structures                                                                                         |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
| CO4                                                                      | Implement the algorithms for matrix problems, merging, searching, sorting, and string manipulation and file problems and debug and test using any procedural programming language. |                   |      |      |      | K3                       |      |      |      |       |       |       |                                  |       |       |
|                                                                          |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| Correlation between Course Outcomes (COs) and Program Outcomes (POs):    |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |
| COs                                                                      | Program Outcomes (POs)                                                                                                                                                             |                   |      |      |      |                          |      |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                          | PO 1                                                                                                                                                                               | PO 2              | PO 3 | PO 4 | PO 5 | PO 6                     | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PSO 1                            | PSO 2 | PSO 3 |
| CO1                                                                      | S                                                                                                                                                                                  | S                 | S    | S    | S    | M                        | L    | L    | M    | M     | -     | M     | -                                | -     | -     |
| CO2                                                                      | S                                                                                                                                                                                  | S                 | S    | S    | S    | M                        | L    | L    | M    | M     | -     | M     | -                                | -     | -     |
| CO3                                                                      | S                                                                                                                                                                                  | S                 | M    | M    | S    | M                        | L    | L    | M    | M     | -     | M     | -                                | -     | -     |
| CO4                                                                      | S                                                                                                                                                                                  | S                 | S    | S    | S    | M                        | L    | L    | S    | S     | -     | S     | -                                | -     | -     |
|                                                                          |                                                                                                                                                                                    |                   |      |      |      |                          |      |      |      |       |       |       |                                  |       |       |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

| LIST OF EXPERIMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| <ol style="list-style-type: none"> <li>1. Basic programs in data types.</li> <li>2. Evaluate Expressions using library Function. <ol style="list-style-type: none"> <li>a. <math>\pi r^2</math></li> <li>b. <math>(A+B+(2C/3A)+A^2+2B)</math></li> <li>c. <math>\sqrt{S(S-A)(S-B)(S-C)}</math></li> <li>d. <math>\text{LOG}(x^3+y^3+z^3)</math></li> </ol> </li> <li>3. Problems in Decision making statements. <ol style="list-style-type: none"> <li>i. Find the Biggest among 3 numbers.</li> <li>ii. Find Even or odd</li> <li>iii. Arithmetic operations using Switch - Case Statements.</li> </ol> </li> <li>4. Problems in looping statements. <ol style="list-style-type: none"> <li>i. Find the Sum of digits using (i) For loop (ii) While loop</li> <li>ii. Generate the Fibonacci series</li> <li>iii. Check whether the number is prime or not.</li> </ol> </li> <li>5. Find the Linear Search.</li> <li>6. General sorting.</li> <li>7. Matrix Manipulation-Addition, Subtraction and Multiplication.</li> <li>8. String operations-string copy, string reverse, string concatenate.</li> <li>9. Swapping of numbers using call by value, call by reference.</li> <li>10. Find factorial using recursive functions.</li> <li>11. Numerical methods-Quadratic Equation.</li> <li>12. Display the student information &amp; marks using Structure &amp; Unions.</li> <li>13. Demonstrate array of structures.</li> <li>14. Pointer Arithmetic and Array access using Pointers.</li> <li>15. Basic File Operations</li> </ol> | <b>45 Hours</b> |



**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                                                                                                                                                                                                                                                                                                                                                                                          |                                                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------|------|------|------|-------|--------------------------|------|------|-------|-------|-------|----------------------------------|-------|-------|
| Course Code                                                                                                                                                                                                                                                                                                                                                                              |                                                                       | L                 | T    | P    | C    | IA    | EA                       | TM   |      |       |       |       |                                  |       |       |
| Course Name                                                                                                                                                                                                                                                                                                                                                                              | SOFT SKILLS                                                           | 2                 | 0    | 0    | 1    | 40    | 60                       | 100  |      |       |       |       |                                  |       |       |
| Course Category                                                                                                                                                                                                                                                                                                                                                                          | VOCATION AND SKILL ENHANCEMENT COURSE                                 | Syllabus Revision |      |      |      | V.1.0 |                          |      |      |       |       |       |                                  |       |       |
| Pre-requisite                                                                                                                                                                                                                                                                                                                                                                            | Knowledge of English Language                                         |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Objectives:</b><br>The course should enable the students -<br>1. To develop communication skills and writing skills through individual / group activities.<br>2. To improve the quality of conversations in day to day life<br>3. To understand the thumb rules in English grammar<br>4. To improve vocabulary in English<br>5. To develop professional and positive attitudes |                                                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| <b>Course Outcomes:</b><br>On completion of the course, the student will be able to                                                                                                                                                                                                                                                                                                      |                                                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| Course Outcomes                                                                                                                                                                                                                                                                                                                                                                          | Description                                                           |                   |      |      |      |       | Highest Bloom's Taxonomy |      |      |       |       |       |                                  |       |       |
| CO1                                                                                                                                                                                                                                                                                                                                                                                      | Have good command over the language                                   |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO2                                                                                                                                                                                                                                                                                                                                                                                      | Write reports and technical documents effectively                     |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO3                                                                                                                                                                                                                                                                                                                                                                                      | Understand the thumb rules in English Grammar                         |                   |      |      |      |       | K3                       |      |      |       |       |       |                                  |       |       |
| CO4                                                                                                                                                                                                                                                                                                                                                                                      | Relate, choose and determine the usage of right vocabulary.           |                   |      |      |      |       | K4                       |      |      |       |       |       |                                  |       |       |
| CO5                                                                                                                                                                                                                                                                                                                                                                                      | Participate in group discussion, interviews and deliver presentations |                   |      |      |      |       | K4                       |      |      |       |       |       |                                  |       |       |
| <b>Correlation between Course Outcomes (COs) and Program Outcomes (POs):</b>                                                                                                                                                                                                                                                                                                             |                                                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| COs                                                                                                                                                                                                                                                                                                                                                                                      | Program Outcomes (POs)                                                |                   |      |      |      |       |                          |      |      |       |       |       | Program Specific Outcomes (PSOs) |       |       |
|                                                                                                                                                                                                                                                                                                                                                                                          | PO 1                                                                  | PO 2              | PO 3 | PO 4 | PO 5 | PO 6  | PO 7                     | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PS O 1                           | PS O2 | PS O3 |
| CO1                                                                                                                                                                                                                                                                                                                                                                                      | -                                                                     | -                 | -    | -    | -    | -     | -                        | M    | -    | M     | -     | -     | -                                | -     | -     |
| CO2                                                                                                                                                                                                                                                                                                                                                                                      | -                                                                     | -                 | -    | -    | -    | -     | -                        | -    | -    | S     | -     | -     | -                                | -     | -     |
| CO3                                                                                                                                                                                                                                                                                                                                                                                      | -                                                                     | -                 | -    | -    | -    | -     | -                        | M    | -    | M     | -     | -     | -                                | -     | -     |
| CO4                                                                                                                                                                                                                                                                                                                                                                                      | -                                                                     | -                 | -    | -    | -    | -     | -                        | -    | -    | S     | -     | -     | -                                | -     | -     |
| CO5                                                                                                                                                                                                                                                                                                                                                                                      | -                                                                     | -                 | -    | -    | -    | -     | -                        | M    | -    | M     | M     | -     | -                                | -     | -     |
|                                                                                                                                                                                                                                                                                                                                                                                          |                                                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 1                                                                                                                                                                                                                                                                                                                                                                                        | Importance of Developing Communication Skills                         |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 2                                                                                                                                                                                                                                                                                                                                                                                        | Common Errors in Spoken English                                       |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 3                                                                                                                                                                                                                                                                                                                                                                                        | Error Correction Exercises                                            |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |
| 4                                                                                                                                                                                                                                                                                                                                                                                        | Thumb Rules in English Grammar                                        |                   |      |      |      |       |                          |      |      |       |       |       |                                  |       |       |





**Syllabus (2025-26)**  
B.E. (Electronics and Communication Engineering)

|                     |                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 5                   | Grammar Exercises Related to Nouns, Verbs & Articles                                                                              |
| 6                   | Reading Comprehension – Sentences, Paragraphs & Passages                                                                          |
| 7                   | Effective Communication Skills – Good Vocabulary & Basic Grammar                                                                  |
| 8                   | Subject Verb Agreement                                                                                                            |
| 9                   | Vocabulary – Synonyms & Antonyms                                                                                                  |
| 10                  | Writing Essays, Reports etc                                                                                                       |
| 11                  | Conversations in Day to Day Life                                                                                                  |
| 12                  | Story Development from Hints                                                                                                      |
| 13                  | Speaking Exercises (Each student to speak for 3 minutes)                                                                          |
| 14                  | Spelling Exercise & Punctuation                                                                                                   |
| 15                  | Pronunciation                                                                                                                     |
| <b>Total Hours</b>  |                                                                                                                                   |
| <b>45 Hours</b>     |                                                                                                                                   |
| <b>Text Book(s)</b> |                                                                                                                                   |
| 1.                  | Dr. NDV. Prasada Rao, “High School English Grammar and Composition”, Wren and Martin, S. Chand Publishers, 2017 Edition.          |
| 2.                  | S. C. Gupta, “English Grammar and Composition”, Very Useful for All Competitive Examinations, Arihant Publications, 2020 Edition. |
| 3.                  | Howard Jackson, “Grammar and Vocabulary: A Resource Book for Students”, Routledge Publications, 2002 Edition.                     |