**Annexure ‘CD – 01’**



**FORMAT FOR COURSE CURRICULUM**

| **L** | **T** | **P/S** | **SW/FW** | **No. of PSDA** | **TOTAL CREDIT UNITS** |
| --- | --- | --- | --- | --- | --- |
| 3 | 0 | 0 | 2 | 2 | 4 |

**Course Title: Applied Mathematics-III Credit Units:4**

**Course Level: UG Course Code: MATH211**

**Course Objectives:**

* To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems.
* To acquaint the student with Fourier transform techniques used in wide variety of situations.
* To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop transform techniques for discrete time systems

**Prerequisites:**

Students must have knowledge of Differential Calculus, Integral Calculus, Partial Derivatives and Complex numbers.

**Course Contents/Syllabus:**

| **Module I PARTIAL DIFFERENTIAL EQUATIONS** | **Weightage%** |
| --- | --- |
| Formation of PDE, equations solvable by direct integration, linear equations of the first order, non-linear equations of the first order, Charpit’s method, homogeneous linear equations with constant coefficients, non homogeneous linear equations with constant coefficients. | **25%** |
| **Module II APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS** |
| Method of separation of variables, solution of heat ,wave and Laplace equation by the method of separation of variables only, classification of partial differential equation into Elliptic, Parabolic and Hyperbolic form and their Canonical form. | **25%** |
| **Module III FOURIER SERIES** |
| Periodic functions, Dirichlet’s conditions, odd and even functions, change of interval,half range sine series,half range cosine series,Practical Harmonic analysis, Parseval’s identity. | **30%** |
| **Module IV FOURIER TRANSFORMS** |
| Fourier integral, Fourier sine and cosine integral, Fourier transforms, Fourier sine and cosine transforms, Inverse Fourier sine and cosine transforms. | **20%** |

**Course Learning Outcomes:**

After completing this course, students will be able to:

* Understand the mathematical principles on Fourier Series
* Analyze and find the transforms
* Evaluate and differentiate between different techniques to solve partial differential equations
* Formulate, differentiate and solve some of the physical problems of engineering.

**Pedagogy for Course Delivery:**

1. The course pedagogy will include Four quadrant approach i.e. video lectures, presentations, e-content, discussions and assessments.

2. All the topics covered in the syllabus will be correlated with its applications in real life situations and also in other disciplines.

3. In order to inculcate problem solving ability in students’ time to time quiz, viva, home assignments and class tests will be conducted during the progress of semester.

4. Video lectures and extra sessions for revision will be undertaken.

**List of Professional Skill Development Activities (PSDA):**

1. **Guest lecture by an expert.**
2. **Group discussion.**

**Lab/ Practicals details, if applicable:**

**List of Experiments:**



**Assessment/ Examination Scheme:**

| **Theory L/T (%)** | **Lab/Practical/Studio (%)** |
| --- | --- |
| **100%** | **NA** |

**Theory Assessment (L&T):**

| **Continuous Assessment/Internal Assessment**  **(\_\_\_\_ %)** | | | | | | | **End Term Examination**  **(\_\_\_%)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Components (Drop down)** | **MID TERM** | **HOME ASSIGNMENT** | VIVA VOCE | CLASS QUIZ | CLASS TEST | **ATTENDANCE** |  |
| **Linkage of PSDA with Internal Assessment Component, if any** |  |  | VIVA VOCE |  |  |  |  |
| **Weightage (%)** | 10 | 10 | 5 | 5 | 5 | 5 | 60 |

**Lab/ Practical/ Studio Assessment:**

|  | **Continuous Assessment/Internal Assessment**  **(\_\_\_\_ %)** | | | | **End Term Examination**  **(\_\_\_\_ %)** | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Components (Drop down** |  |  |  |  |  |  |  |
| **Weightage (%)** |  |  |  |  |  |  |  |

**Text Reading:**

* Engineering Mathematics by Erwin Kreyszig
* Advanced Engineering Mathematics by R. K. Jain, S. R. K. Iyengar
* Partial Differential Equations by I.N. Snedon
* Engineering Mathematics by H. K. Das

**Mapping Continuous Evaluation components /PSDA with CLOs**

| Bloom’s Level > | Remembering | Understanding | Applying | Analyzing | Evaluating | Creating |
| --- | --- | --- | --- | --- | --- | --- |
| Course Learning Outcomes  Assessment type/PSDA | CLO1 | CLO2 | CLO3 | CLO4 | CLO5 | CLO 6 |
| Class Test |  |  |  |  |  |  |
| Home Assignment |  |  |  |  |  |  |
| Class Quiz |  |  |  |  |  |  |
| Viva Voce |  |  |  |  |  |  |