**Lesson Plan**

**Name of faculty: Visiting Faculty**

**Discipline: Mechanical**

**Semester: 4th**

**Subject: Mathematics - III (Only Theory Subject)**

Lesson Plan Duration: 15 weeks (from January, 2018 to April, 2018)

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| **Week** | **Theory** | |
|  | **Lecture day** | **Topic(Including assignment/ test)** |
| 1st |  | **Chapter 1 : Fourier Analysis**  Fourier series: Euler’s formulae |
|  | Orthogonality conditions for the Sine and Cosine function, Dirichlet’s conditions |
|  | Fourier expansion of functions having points of discontinuity |
| 2nd |  | Change of interval |
|  | Odd and even functions |
|  | Half-range series |
| 3rd |  | **Chapter 2 : Fourier Transforms**: Fourier integrals, Fourier transforms |
|  | Fourier Cosine and Sine transforms |
|  | Properties of Fourier transforms |
| 4th |  | Convolution theorem |
|  | Parseval’s identity |
|  | Fourier transforms of the derivative of a function |
| 5th |  | Application of transforms to boundary value problems (Heat conduction and vibrating string) |
|  | **Chapter 3 : Partial Differential Equations and LPP** Formation and Solutions of PDE, , , , ,. |
|  | Lagrange’s Linear PDE |
| 6th |  | First order non-linear PDE |
|  | Charpit’s method |
|  | Homogeneous linear equations with constant coefficients |
| 7th |  | Method of separation of variables |
|  | **Chapter 4 : Solution of linear programming problems**: using Graphical Method |
|  | Simplex methods |
| 8th |  | **Chapter 5 : Theory of Complex Variables:** A review of concept of functions of a complex variable, Limit |
|  | Continuity, differentiability and analyticity of a function |
|  | Basic elementary complex functions (exponential functions) |
| 9th |  | Trigonometric & Hyperbolic functions, logarithmic functions |
|  | Cauchy-Riemann Equations |
|  | Line integral in complex plane |
| 10th |  | Definition of the complex line integral |
|  | Basic properties, Cauchy’s integral theorem, and Cauchy’s integral formula |
|  | Brief of Taylor’s Theorem |
| 11th |  | Brief of Laurent’s Theorem |
|  | Brief of Residue Theorem |
|  | **Chapter 6 : Probability theory :** A review of concepts of probability and random variables |
| 12th |  | Definitions of probability, addition rule |
|  | Conditional probability, multiplication rule |
|  | Conditional Probability |
| 13th |  | Mean, median, mode and standard deviation |
|  | Bayes’ Theorem |
|  | Discrete and continuous random variables |
| 14th |  | Probability mass, probability density |
|  | Cumulative distribution functions, mathematical expectation |
|  | Moments, moment generating function |
| 15th |  | **Chapter 7 : Standard Distributions:** Binomial Distribution |
|  | Poisson Distribution |
|  | Normal distribution |