Lagdu Singh Charitable Trust's (Regd.)
THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY
(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai*)
(Accredited Programmes by National Board of Accreditation, New Delhi**)
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Kandivali (East), Mumbai - 400 101.
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ISO 9001 : 2008 Certified

*Permanent Affiliated UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (w.e.f.: A.Y. 2015-16 onwards)
• Electronics Engineering (w.e.f.:A.Y.2017-18 onwards)
**1st time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (3 years w.e.f.: 16-09-2011)
**2nd time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology • Electronics Engineering (3 years w.e.f.: 01-07-2016)

**Semester Plan**

**TCET/FRM/IP-02/10** **(Theory)** **Revision: A**

**Semester: III** **Course: EXTC**

**Subject: Applied Mathematics III** **Class: SE EXTC -B**

| S.No. | Prerequisite/ Bridge course: | Duration (Week /Hrs) | Modes of Learning | Recommended Sources |
|---|---|---|---|---|
| 1 | Standard Integral Forms, Partial fraction, Limits, Continuity and Differentiability, concept of Partial differential equations, concept of vector Algebra, | 6 hours | Self Learning/ Revision | 1. Advanced Calculus - Schaum's Series; Murray Spiegel 2.Advanced Engineering Mathematics - Kreyzig. |

| Sr.No | Module No. | Lesson No. | Topics Planned | Teaching Aids Required | Planned Date | Completed Date | Recourse Book Reference | Remark |
|---|---|---|---|---|---|---|---|---|
| 1 | - | L1.1 | Orientation of Subject AM III (Theory) | PPT | 11-07-17 | | - | |
| 2 | - | L1.2 | Orientation of Subject AM III (Outcome Base Education) | PPT | 12-07-17 | | - | |
| 3 | $M_1$ | L1.3 | Introduction to Laplace Transform:Definition,Condition of Existence of Laplace transform | Chalk Board, PPT | 13-07-17 | | 1.7 ,1.8 | |
| 4 | $M_1$ | L1.4 | Laplace Transform (LT) of Standard Functions: Laplace transform of eat , Sin(at), cos(at), sinh(at), cosh(at), tn | Chalk Board, PPT | 14-07-17 | | 1.8,1.9 | |
| 5 | $M_1$ | L2.1 | Properties of LT: Linearity, Change of scale, first shifting theorem | Chalk Board, PPT | 17-07-17 | | 1.10,1.11,1.12 | |
| 6 | $M_1$ | L2.2 | second shifting theorem, Laplace of multiplication by t, Laplace of division by t | Chalk Board | 18-07-17 | | 1.13,1.14 | |
| 7 | $M_1$ | L2.3 | Laplace Transform of derivatives and integrals | Chalk Board | 19-07-17 | | 1.15 | |
| 8 | $M_1$ | L2.4 | Evaluation of integrals using LT | Chalk Board | 20-07-17 | | 1.16 | |
| 9 | $M_1$ | L2.5 | Problems on Heaviside unit step, Dirac-delta function and problems | Chalk Board | 21-07-17 | | 1.17,1.18 | |
| 10 | $M_1$ | L3.1 | LT of periodic function | Chalk Board | 25-07-17 | | 1.19 | |
| 11 | M2 | L3.2 | Introduction to inverse Laplace transform(ILT), Inverse LT of Standard Functions,First Shifting Theorem of ILT | Chalk Board | 26-07-17 | | 2.9,2.10 | |
| 12 | M2 | L3.3 | Inverse Laplace Transform by partial fraction Methods | Chalk Board, PPT | 27-07-17 | | 2.11 | |
| 13 | M2 | L3.4 | Inverse LT by convolution theorem | Chalk Board | 28-07-17 | | 2.12 | |
| 14 | M2 | L4.1 | Laplace Inverse by derivative | Chalk Board, | 01-08-17 | | 2.13,2.14 | |
| 15 | M2 | L4.2 | Applications of Laplace Transform:Solution of ordinary differential equations | Chalk Board | 02-08-17 | | 2.15 | |

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| 16 | M2 | L4.3 | Solving RLC circuit differential equation of first order and second order with boundary condition using Laplace transform | Chalk Board | 03-08-17 | | 2.15 | |
| 17 | M2 | L4.4 | Introduction of Complex Variable: Analytic Function,Necessary and sufficient conditions to be analytic function | Chalk Board | 04-08-17 | | 3a.9 | |
| 18 | M3 | L5.1 | Cauchy Riemann equation in Cartesian form and in polar form, problems | Chalk Board | 07-08-17 | | 3a.9,3a.10 | |
| 19 | M3 | L5.2 | Milne's Thomson method & its application to find f(z) | Chalk Board, | 08-08-17 | | 3a.10 | |
| 20 | M3 | L5.3 | Harmonic functions and problems based on it | Chalk Board | 09-08-17 | | 3a.10 | |
| **Sr.No** | **Module No.** | **Lesson No.** | **Topics Planned** | **Teaching Aids Required** | **Planned Date** | **Completed Date** | **Recourse Book Reference** | **Remark** |
| 21 | M3 | L5.4 | Orthogonal trajectories and problems | Chalk Board | 10-08-17 | | 3a.10 | |
| 22 | M3 | L5.5 | Conformal mapping and problems | Chalk Board | 11-08-17 | | 3a.11 | |
| 23 | M3 | L6.1 | Bilinear transformations, cross ratio, fixed points | Chalk Board | 16-08-17 | | 3a.12 | |
| 24 | M3 | L6.2 | Bessel Functions:Bessel's differential equation | Chalk Board | 18-08-17 | | 3b.9 | |
| 25 | M3 | L7.1 | Properties of Bessel function of order +1/2 and -1/2 | Chalk Board | 24-08-17 | | 3b.10 | |
| 26 | M4 | L8.1 | Generating function, expression of cos(xsinθ ), sin (x sinθ ) in term of Bessel functions | Chalk Board | 30-08-17 | | 3b.11 | |
| 27 | M4 | L8.2 | Introduction to Fourier Series (FS): Definition, Dirichlet's conditions,Euler's formulae | Chalk Board | 31-08-17 | | 4.9 | |
| 28 | M4 | L8.3 | Fourier series of periodic functions with period 2π | Chalk Board | 01-09-17 | | 4.9 | |
| 29 | M4 | L9.1 | Fourier series of periodic functions with period 2l | Chalk Board | 05-09-17 | | 4.10 | |
| 30 | M4 | L9.2 | Fourier series of even and odd functions | Chalk Board | 06-09-17 | | 4.10 | |
| 31 | M4 | L9.3 | Fourier half range Sine and Cosine series | Chalk Board | 07-09-17 | | 4.11 | |
| 32 | M4 | L9.4 | Orthogonal and Orthonormal set of functions | Chalk Board | 08-09-17 | | 4.12 | |
| 33 | M4 | L10.1 | Complex form of Fourier Series | Chalk Board | 12-09-17 | | 4.13 | |
| 34 | M4 | L10.2 | Fourier Integral Representation | Chalk Board | 13-09-17 | | 4.14 | |
| 35 | M5 | L10.3 | Fourier Transform of constant and exponential function | Chalk Board | 14-09-17 | | 4.15 | |
| 36 | M5 | L10.4 | Inverse Fourier transform of constant and exponential function | Chalk Board, PPT | 15-09-17 | | 4.15 | |
| 37 | M5 | L11.1 | Review of Scalar and Vector Product: Scalar and vector product of three and four vectors | Chalk Board | 19-09-17 | | 5.90 | |
| 38 | M5 | L11.2 | Vector differentiation,Gradient of scalar point function | Chalk Board | 20-09-17 | | 5.9,5.10,5.11 | |
| 39 | M5 | L11.3 | Divergence of vector point function | Chalk Board | 21-09-17 | | 5.12 | |
| 40 | M5 | L11.4 | Curl of vector point function | Chalk Board | 22-09-17 | | 5.12 | |
| 41 | M6 | L12.1 | Properties of Solenoidal & irrotational vector fields | Chalk Board | 25-09-17 | | 5.13 | |
| 42 | M6 | L12.2 | Properties of Conservative vector fields | Chalk Board | 26-09-17 | | 5.13 | |

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| 43 | M6 | L13.1 | Vector Integral : Line integral | Chalk Board | 03-10-17 | | 6.90 | |
| 44 | M6 | L13.2 | Problems continued on Line Integral | Chalk Board | 04-10-17 | | 6.90 | |
| 45 | M6 | L13.3 | Evaluate Integral by Green's theorem in a plane | Chalk Board | 05-10-17 | | 6.10 | |
| 46 | M6 | L13.4 | Problems continued on Green's theorem | Chalk Board | 06-10-17 | | 6.10 | |
| 47 | M6 | L14.1 | Use Gauss' divergence theorem to evaluate the integral | Chalk Board | 12-10-17 | | 6.11 | |
| 48 | M6 | L14.2 | Use Stoke's theorem to evaluate the integral | Chalk Board | 13-10-17 | | 6.12 | |

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| Remark:<br>Course: | Syllabus Coverage: | Practice Session: 2 | **Content Beyond Syllabus:** Class of Integral Transform and kernel e.g. Mellin Transform, Hankel Transform and their Applications to solve system of differential equations and simultaneous differential equations. |
| No. of (lectures planned)/(lecture taken): 48 | | | |
| Advanced course: 1. Advanced Engineering Mathematics 2. Regression Analysis 3. Integral Transforms | 20 Hours | Online NPTEL videos /courses | **Web sources:** NPTEL-https://onlinecourses.nptel.ac.in<br>**Textbook reference:** Advanced Engineering Mathematics |

**Text Books:**

1.H.K. Das, "Advanced engineering mathematics", S . Chand, 2008
2.A. Datta, "Mathematical Methods in Science and Engineering", 2012
3. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publication

**Reference Books:**.

1. B. V. Ramana, "Higher Engineering Mathematics", Tata Mc-Graw Hill Publication
2. Wylie and Barret, "Advanced Engineering Mathematics", Tata Mc-Graw Hill 6th Edition 3. Erwin Kreysizg, "Advanced Engineering Mathematics", John Wiley & Sons, Inc
4. Murry R. Spieget, "Vector Analysis", Schaum's outline series, Mc-Graw Hill Publication

**Digital Reference:**

*3.1 www.nptel.ac.in*

Name & Signature of Faculty Signature of HOD Signature of Principal /Dean (Academics)

Date: Date: Date:

**Note:**

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 52 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.