RAJENDRA MANE COLLEGE OF ENGINEERING AND TECHNOLOGY
Department of Mechanical Engineering
Extra Classes Schedule for Golden Attempt Students

Sr. No.	Subject	Faculty	Number of students	Date	Time	Sign
1	AM-III	Prof. Mrs. V. W. Parulekar	04	19/04/19 20/04/19	09.00 am- 05.00 pm	
2	AM-IV	Prof. Mrs. V. W. Parulekar	02	03/05/19 04/05/19	09.00 am- 01.00 pm	
3	FM (IV)	Prof. S. B. Khandekar	13	08/05/19 09/05/19 10/05/19	09.00 am- 05.00 pm	
4	IE	Prof. Mrs. S. B. Kamble	04	29/04/19 30/04/19	09.00 am- 01.00 pm	
5	TOM-I	Prof. A. S. Raut	01	24/04/19	09.00 am- 11.00 am	
6	KOM	Prof. A. S. Raut	01	24/04/19	02.15 pm- 04.15 pm	
7	PP-II	Prof. G. S. Jagushte	03	20/05/19 21/05/19 22/05/19	11.00 am- 01.00 pm	

Dr. S. N. Waghmare
HOD Mechanical

Dr. M. M. Bhagwat
Principal, RMCET.

RAJENDRA MANE COLLEGE OF ENGINEERING AND TECHNOLOGY, AMBAV (DEVRUKH)

ATTENDANCE SHEET : THEORY/PRACTICAL

NAME OF SUBJECT : Applied Mathematics III (Remedial) SEM : III

NAME OF TEACHER: Mrs. V. W. Parulekar. ACADEMIC YEAR : 2018-19

Sr. No.	NAME OF STUDENT	19/4/19	19/4/19	19/4/19	19/4/19	19/4/19	19/4/19	20/4/19	20/4/19	20/4/19	20/4/19	20/4/19	20/4/19
01	Rupak Tribhuvane	P	P	P	P	P	P	P	P	P	P	P	P
02	Prathmesh Manorkar.	A	A	A	A	A	A	A	A	A	A	A	A

Course Code	Course Name	Credits
MEC301	**Applied Mathematics III****	04

Objectives

1. To provide sound foundation in the mathematical fundamentals necessary to formulate, solve and analyse engineering problems.
2. To study the basic principles of Laplace Transform, Fourier Series, Complex variables.

Outcomes: Learner will be able to…

1. Demonstrate the ability of using Laplace Transform in solving the Ordinary Differential Equations and Partial Differential Equations
2. Demonstrate the ability of using Fourier Series in solving the Ordinary Differential Equations and Partial Differential Equations
3. Solve initial and boundary value problems involving ordinary differential equations
4. Identify the analytic function, harmonic function, orthogonal trajectories
5. Apply bilinear transformations and conformal mappings
6. Identify the applicability of theorems and evaluate the contour integrals.

Module	Detailed Contents	Hrs
1	**Laplace Transform** 1.1 Function of bounded variation, Laplace Transform of standard functions such as 1, t^n, e^{at}, $\sin at$, $\cos at$, $\sinh at$, $\cosh at$ 1.2 Linearity property of Laplace Transform, First Shifting property, Second Shifting property, Change of Scale property of L.T. (without proof) $L\{t^n f(t)\}, L\left\{\frac{f(t)}{t}\right\}, L\left\{\int_0^t f(u)du\right\}, L\left\{\frac{d^n f(t)}{dt^n}\right\}$ Laplace Transform. of Periodic functions 1.3 Inverse Laplace Transform: Linearity property, use of theorems to find inverse Laplace Transform, Partial fractions method and convolution theorem(without proof). 1.4 Applications to solve initial and boundary value problems involving ordinary differential equations with one dependent variable	12
2	**Complex variables:** 2.1 Functions of complex variable, Analytic function, necessary and sufficient conditions fo $f(z)$ to be analytic (without proof), Cauchy-Riemann equations in polar coordinates. 2.2 Milne- Thomson method to determine analytic function $f(z)$ when it's real or imaginary or its combination is given. Harmonic function, orthogonal trajectories **2.3** Mapping: Conformal mapping, linear, bilinear mapping, cross ratio, fixed points and standard transformations such as Rotation and magnification, inversion and reflection, translation	08
3	**Complex Integration:** 3.1 Line integral of a function of a complex variable, Cauchy's theorem for analytic functions(without proof)Cauchy's integral formula (without proof))Singularities and poles: 3.2 Taylor's and Laurent's series development (without proof) 3.3 Residue at isolated singularity and its evaluation 3.4 Residue theorem, application to evaluate real integral of type $\int_0^{2\pi} f(\cos\theta, \sin\theta)\, d\theta$, & $\int_{-\infty}^{\infty} f(x)\, dx$	08
4	**Fourier Series:** 4.1 Orthogonal and orthonormal functions, Expressions of a function in a series of orthogonal functions. Dirichlet's conditions. Fourier series of periodic function with period 2π *and* $2l$	10

	4.2 Dirichlet's theorem(only statement), even and odd functions, Half range sine and cosine series,Parsvel's identities (without proof) 4.3 Complex form of Fourier series	
5	**Partial Differential Equations:** 5.1. Numerical Solution of Partial differential equations using Bender-Schmidt Explicit Method, Implicit method (Crank- Nicolson method). 5.2. Partial differential equations governing transverse vibrations of an elastic string its solution using Fourier series. 5.3. Heat equation, steady-state configuration for heat flow 5.4. Two and Three dimensional Laplace equations	09
6	**Correlation and curve fitting** 6.1. Correlation-Karl Pearson's coefficient of correlation- problems, Spearman's Rank correlation problems, Regression analysis- lines of regression (without proof) –problems 6.2. Curve Fitting: Curve fitting by the method of least squares- fitting of the curves of the form, $y = ax + b$, $y = ax^2 + bx + c$ and $y = ae^{bx}$	05

Assessment:

Internal Assessment for 20 marks:

Consisting **Two Compulsory Class Tests**

First test based on approximately 40% of contents and second test based on remaining contents (approximately 40% but excluding contents covered in Test I)

End Semester Examination:

Weightage of each module in end semester examination will be proportional to number of respective lecture hours mentioned in the curriculum.

1. Question paper will comprise of total **six questions, each carrying 20 marks**
2. **Question 1** will be **compulsory** and should **cover maximum contents of the curriculum**
3. **Remaining questions will be mixed in nature** (for example if Q.2 has part (a) from module 3 then part (b) will be from any module other than module 3)
4. Only **Four questions need to be solved.**

References:

1. Higher Engineering Mathematics, Dr B. S. Grewal, Khanna Publication
2. Advanced Engineering Mathematics, E Kreyszing, Wiley Eastern Limited
3. Higher Engineering Mathematics, B.V. Ramana, McGraw Hill Education, New Delhi
4. Complex Variables: Churchill, Mc-Graw Hill
5. Integral Transforms and their Engineering Applications, Dr B. B. Singh, Synergy Knowledgeware, Mumbai
6. Numerical Methods, Kandasamy, S. Chand & CO
7. Fundamentals of mathematical Statistics by S.C.. Gupta and Kapoor