

PDA COLLEGE OF ENGINEERING, KALABURAGI
B E. Fourth Semester

ADDITIONAL MATHEMATICS - II

(Mandatory Learning Course: Common to All Branches)
 (A Bridge course for Lateral Entry students of III Sem. B. E.)
 [As per Choice Based Credit System (CBCS) scheme]
 (From the academic year 2022-23)

Course Code	21MAD41	CIE Marks	50
Credits	00	SEE Marks	50
Contact Hours/Week (L-T-P)	3-0-0	Total Marks	100
Contact Hours	42	Exam Hours	03

Course Objectives:

The mandatory learning course **18MAD41** viz., **Additional Mathematics-II** aims to provide essential concepts of linear algebra, introductory concepts of second & higher order differential equations along with methods to solve them, partial differential equations, Laplace & inverse Laplace transforms

Module-I

10 hours

1.Linear Algebra: Introduction - rank of matrix by elementary row operations - Echelon form. Consistency of system of linear equations - Gauss elimination method. Eigen values and Eigen vectors of a square matrix using Reyleigh's power method .
Numerical solution of ODE: Numerical solution of ODE using Taylor's series method, modified Euler's method, Runge-Kutta fourth order method.

RBT Levels: L1, L2 & L3

Module-II

10 hours

2.Higher order ODE's: Linear differential equations of second and higher order equations with constant coefficients. Homogeneous /non-homogeneous equations. Inverse differential operator method for $f(D)y=R(x)$ where $R(x)= e^{ax}, \sin(ax), \cos(ax)$, and polynomial in x only..

RBT Levels: L1, L2 & L3

Module –III

10 hours

3.Partial Differential Equations(PDE's):-Formation of PDE's by elimination of arbitrary constants and functions. Solution of non-homogeneous PDE by direct integration, method of separation of variables. Homogeneous PDEs involving derivative with respect to one independent variable only.

RBT Levels: L1, L2 & L3

Module-IV**10 hours**

4.Laplace transforms: Laplace transforms of elementary functions. Transforms of derivatives and integrals, transforms of periodic function and unit step function-Problems only.

Inverse Laplace transforms: Definition of inverse Laplace transforms. Evaluation of inverse transforms by standard methods. Application to solutions of Linear differential equations

RBT Levels: L1, L2 & L3

Text Book:

B.S. Grewal: Higher Engineering Mathematics, Khanna Publishers, New Delhi, 43rd Ed., 2015.

Reference books:

1. *E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed., 2015.*

2. *N.P.Bali and Manish Goyal: Engineering Mathematics, Laxmi Publishers, 7th Ed., 2007.*

E-Books and Online resources:

- <http://.ac.in/courses.php?disciplineID=111>
- [http://www.class-central.com/subject/math\(MOOCs\)](http://www.class-central.com/subject/math(MOOCs))
- <http://academicearth.org/>

Pedagogy (General Instructions):

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. In addition to the traditional lecture method, different types of innovative teaching methods may be adopted so that the delivered lessons shall develop student's theoretical and applied mathematical skills.
2. State the need for Mathematics with Engineering Studies and Provide real-life examples
3. Support and guide the students for self-study.
4. You will also be responsible for assigning homework, grading assignments and quizzes, and documenting students' progress.
5. Encourage the students for group learning to improve their creative and analytical skills.
6. Show short related video lectures in the following ways:

- As an introduction to new topics (pre-lecture activity).
- As a revision of topics (post-lecture activity).
- As additional examples (post-lecture activity).
- As an additional material of challenging topics (pre-and post-lecture activity).
- As a model solution of some exercises (post-lecture activity)

Question Paper Pattern:

Note:- The SEE question paper will be set for 100 marks and the marks will be proportionately reduced to 50.

- The question paper will have **Eight** full questions carrying equal marks.□
- Each full question consisting of **20** marks.□
- □ The students will have to answer **five** full questions