VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

SYLLABUS FOR 2015 -2019

ADDITIONAL MATHEMATICS - II
(Mandatory Learning Course: Common to All Branches)
(A Bridge course for Lateral Entry students of IV Sem. B. E.)

Course Title: Additional Mathematics - II	**Course Code : 15MATDIP41**
Contact Hours/Week : 03	**L-T-P : 3-0-0**
Total Hours: 40	**Exam. Hours : 03**
Exam. Marks : 80	**Credits : 00**

Course Objectives

The mandatory learning course **15MADIP41** 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, Laplace & inverse Laplace transforms and elementary probability theory.

MODULE	RBT Levels	No. of Hrs
MODULE-I **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. Application of Cayley-Hamilton theorem (without proof) to compute the inverse of a matrix-Examples.	L1 & L2	08
MODULE-II **Higher order ODE's:** Linear differential equations of second and higher order equations with constant coefficients. Homogeneous /non-homogeneous equations. Inverse differential operators. Solutions of initial value problems. Method of undetermined coefficients and variation of parameters.	L1 & L2	10
MODULE-III **Laplace transforms**: Laplace transforms of elementary functions. Transforms of derivatives and integrals, transforms of periodic function and unit step function-Problems only.	L1 & L2	08

MODULE-IV **Inverse Laplace transforms**: Definition of inverse Laplace transforms. Evaluation of Inverse transforms by standard methods. Application to solutions of Linear differential equations and simultaneous differential equations.	**L1 & L2**	**08**
MODULE-V **Probability:** Introduction. Sample space and events. Axioms of probability. Addition and multiplication theorems. Conditional probability – illustrative examples. Bayes's theorem-examples.	**L1 & L2**	**06**

Course Outcomes: On completion of this course, students are able to,

1. Use matrix theory for solving systems of linear equations in the different areas of linear algebra.
2. Solve second and higher order differential equations occurring in of electrical circuits, damped/un-damped vibrations.
3. Learn the Laplace transforms of standard and periodic functions.
4. Utilize the inverse Laplace transforms to determine general or complete solutions to linear ODE.
5. Explore the basic concepts of elementary probability theory and, apply the same to the problems of decision theory, synthesis and optimization of digital circuits.

 Question paper pattern:

- The question paper will have **ten** full questions carrying equal marks.
- Each full question consisting of **16** marks.
- There will be **two** full questions (with a **maximum** of **four** sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer **five** full questions, selecting **one** full question from each module.

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.