

# SHARNBASVA UNIVERSITY, KALABURAGI

## ADDITIONAL MATHEMATICS - II (B.Tech. III semester Common to all branches) (A Bridge course for Lateral Entry students of IV Sem. B.Tech.)

[As per Choice Based Credit System (CBCS) scheme]  
(Effective from the academic year 2019-20)

Course Code : 18MATDIP41

Contact Hours/Week : 03

Total Hours:40

Semester : IV

CIE Marks : 50

SEE Marks: 50

Exam Hours:03

Credits: 00

### Course Learning Objectives:

This course will enable students to:

- Solve first order differential equations. .
- Solve second and higher order differential equations.
- Understand and solve the partial differential equation.
- To acquire the knowledge of elementary probability theory.
- Know the basic concepts of evaluation of double and triple integrals.

### MODULE-I

#### Differential Equation-1:-

Solution of first order and first degree differential equations: Variable separable, Homogeneous, Exact and Reducible to exact differential equation, Linear differential equation. Applications of first order first degree differential equations: Newton's law of cooling.

8 - Hours

### MODULE-II

**Differential Equations-2:-** Solution of second & higher order Ordinary linear differential equation with constant co-efficients. Method of variation of parameters. Solution of homogeneous LDE by Power series solution Method.

8 - Hours

### MODULE-III

**Partial Differential Equations(PDE's):-** Formation of PDE by eliminating arbitrary constant & functions, Solution of Non-homogeneous PDE by direct integration, solution of homogeneous PDE with respect to one independent variable only. Derivation of one dimensional wave equation and heat equation and Various possible solution of wave & heat equations by methods of separation of variables.

8 - Hours

### MODULE-IV

Improper Integrals: Beta and gamma functions and its properties and examples.

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Evaluation of double integral over a specific region, changing the order of integration , changing into polar form.

8 - Hours

### MODULE-V

Probability: Introduction , Sample space and Events. Axioms of Probability, Addition & Multiplication theorems. Conditional probability- illustrative examples. Baye's theorem-examples.

8 – Hours

### Course Outcomes:

On completion of this course, students are able to:

- Solve first order differential equations in the different areas of Engineering.
- Solve second and higher order differential equations occurring in of electrical circuits, damped/un-damped vibrations.
- Solve second order partial differential equations in the different areas in the real world.
- Recall basic concepts of elementary probability theory and, solve problems related to the decision theory, synthesis and optimization of digital circuits.
- To find the surface area and volume of 3D objects.

### Question paper pattern:

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four subquestions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

### Text Book:

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

### Reference Books:

1. *E. Kreyszig: Advanced Engineering Mathematics, John Wiley & Sons, 10th Ed., 2015.*
2. *N.P.Bali and Manish Goyal: A Text Book of Engineering Mathematics, Laxmi Publishers, 7th Ed., 2007.*

*[Handwritten signatures and initials]*

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