UNIVERSITY OF MADRAS
U.G. DEGREE COURSE
SYLLABUS WITH EFFECT FROM 2020-2021

BMA-CSA02

ALLIED MATHEMATICS –II

Credits: 5   **Year: I/II, Sem:II/IV**

LEARNING OUTCOMES:

- Students gain knowledge about basic concepts of Differential Equations, Laplace Transforms, Vector Analysis and Calculus.

UNIT I

Integral Calculus:Bernoullis formula – Reduction formulae-$\int_0^{\pi/2} sin^n x\, dx$, $\int_0^{\pi/2} cos^n x\, dx$,$\int_0^{\pi/2} sin^m x cos^n x dx$(m,n being positive integers), Fourier series for functions in $(0,2\pi)$, $(-\pi, \pi)$.
Chapter 2: Section 2.7 & 2.9 , Chapter 4: Section 4.1.

UNIT II

Differential Equations:
Ordinary Differential Equations: second order non- homogeneous differential equations with constant coefficients of the form ay" +by'+ cy = X where X is of the form $e^{\alpha x} \cos \beta x$ and $e^{\alpha x} \sin \beta x$ -Related problems only.

Partial Differential Equations: Formation, complete integrals and general integrals, four standard types and solving Lagrange's linear equation P p +Q q= R.

Chapter 5: Section 5.2.1, Chapter 6: Section 6.1 to 6.4

UNIT III

Laplace Transforms: Laplace transformations of standard functions and simple properties, inverse Laplace transforms,Application to solution of linear differential equations up to second order- simple problems.
Chapter 7: Section 7.1.1 to 7.1.4& 7.2 to 7.3

UNIT IV

Vector Differentiation: Introduction, Scalar point functions, Vector point functions, Vector differential operatorGradient,Divergence, Curl, Solenoidal, irrotational, identities.
Chapter 8, Section 8.1 to 8.4.4

UNIT V

Vector Integration:Line, surface and volume integrals, Gauss, Stoke's and Green's theorems (without proofs). Simple problems on these.
Chapter 8, Section 8.5 to 8.6.3.

Content and treatment as in

Allied Mathematics, Volume I and II , P. Duraipandian and S. Udayabaskaran, S. Chand Publications.

Reference:-

1.   S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.

2.   Allied Mathematics by Dr. A. Singaravelu, Meenakshi Agency.

e-Resources:

1. http://www.sosmath.com
2. http://www.analyzemath.com/Differential_Equations/applications.html