MA-121 Applied Mathematics-II							
Teaching Scheme			Credit	Marks Distribution			Duration of End Semester Examination
L	T	P		Internal Assessment	End Semester Examination	Total	
3	1	0	4	Maximum Marks: 40	Maximum Marks: 60	100	3 Hours
				Minimum Marks: 16	Minimum Marks: 24	40	

Guidelines for setting Question Paper: Question paper of end semester examination will be of 60 marks. The question paper will consist of five sections A, B, C, D and E. Sections A, B, C and D will have 2 questions of 12 marks each (Each subdivided into at least two equal sub-parts) and section E has short answer type questions consisting of six parts of 02 marks each or twelve parts of 01 marks each. The candidate will attempt five questions in all, i.e one question each from sections A, B, C, D and the section E will be compulsory. In the question paper, the questions available in sections A, B, C and D will be covered from Unit-I, Unit-II, Unit-III and Unit-IV respectively and section-E will cover whole syllabus

Course Contents:

Unit-I:
Ordinary Differential Equations: Review of first order linear differential equations, Exact differential equations, Second and higher order linear differential equations with constant coefficients, Cauchy 's & Legendre 's homogeneous differential equations, method of variation of parameters, Cauchy - Euler equation.
Unit–II:
Partial Differential Equations: Introduction, Homogeneous and non-homogeneous linear PDE with constant coefficients. **Applications of PDE**: Method of separation of variables, Solution of one-dimensional wave and heat equation and two-dimensional Laplace's equation.
Unit–III
Laplace Transforms: Laplace transforms and its properties, Inverse Laplace transforms using partial fraction, convolution theorem (without proof), Unit step function and Impulse function, Applications to solve initial and boundary value problems. **Fourier Series**: Introduction, Fourier series on arbitrary intervals, Even Odd functions, Half range expansions, Parseval 's theorem.
Unit-IV:
Vector calculus: Introduction to vectors, vector algebra, directional derivatives, gradient, divergence & curl, Scalar line integrals, line integrals, surface integrals, Green, Stokes and Gauss divergence theorem (without proof)

Textbooks:

- R.K. Jain and S.R.K. Iyengar, Advanced Engineering Mathematics (2003), 2nd ed.
- B.S. Grewal, —Higher Engineering Mathematicsl, Khanna Publishers.
- H.K. Dass and Rama Verma, —Engineering Mathematicsl, S. Chand Publications.
- Thomas, G.B. and Finney, R.L., Calculus and Analytic Geometry, Pearson Education (2007),9thed.

Reference Books:

- E. Kreyszig, Advanced engineering mathematics (8th Edition), John Wiley (1999).
- N. P. Bali and Manish Goyal A Textbook of Engineering Mathematics (2016)
- Wider David V, Advanced Calculus: Early Transcendentals, Cengage Learning (2007).
- Apostol Tom M, Calculus, Vol I and II, John Wiley (2003)
- B.V. Ramana, —Higher Engineering Mathematicsl, Tata McGraw Hill Education Pvt. Ltd., New Delhi

Dean - Academic
H.P. Technical University
Hamirpur - 177 001, HP