

DEPARTMENT OF MATHEMATICS
B.Sc Mapping of COs with POs
SEMESTER-I

| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PO13 | | |
|--------------|---|-----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|---|---|
| MAH107B | ALGEBRA | CO1 | Understand and apply the basic concepts of sets, relations, functions, mathematical induction and division algorithm. | 3 | 3 | 3 | 3 | 1 | - | 2 | - | 2 | - | 1 | - | - | | |
| | | CO2 | Understand and apply the concepts of congruence in the study of algebraic structures. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | - | - | - | |
| | | CO3 | Find the solution and transformation of polynomial equations . | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | 1 | - | - | |
| | | CO4 | Understand and apply the concepts hyperbolic functions, direct and inverse circular functions and Gregory series to further applications. | 3 | 3 | 1 | 3 | 1 | - | 2 | - | 2 | - | - | - | - | - | |
| MAH108B | CALCULUS-I | CO1 | Develop a foundation of elementary tools in Calculus: limit, continuity, differentiability & curve tracing. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | 2 | - | | |
| | | CO2 | Apply the concepts of limits, continuity & differentiability to pure and applied mathematics problems. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - | |
| | | CO3 | Use the properties of limits and the derivative to analyze graphs of various functions of single & several variable. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | - | 2 | 2 | - | |
| | | CO4 | demonstrate concepts of curve tracing and curvature in various mathematical & engineering problems. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - | |
| | | CO5 | Recognize the appropriate tools of calculus to solve applied mathematical & engineering problems. | 3 | 3 | 3 | 3 | 1 | - | 3 | - | 2 | - | 2 | 2 | 2 | 2 | - |
| CSH105B | PROGRAMMING FOR PROBLEM SOLVING USING C | CO1 | Analyse and apply Test Driven Development approach to design programs. | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | - | |
| | | CO2 | Understand and apply programming language constructs as per given problems | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | 2 | - |
| | | CO3 | Understand and apply C programming language constructs on opensource platform | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | 2 | - |
| | | CO4 | learn to work in a team using different online platform for program development | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | 2 | - |
| PHH106B | ESSENTIALS OF PHYSICS | CO1 | Produce and analyze the interference pattern due to division of amplitude & wave front | 3 | 3 | 3 | 2 | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | - | |
| | | CO2 | Produce required quality Spectrum and analyze it using appropriate diffraction grating. | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | - | 1 | 2 | 2 | - | |
| | | CO3 | Measure the concentration/purity of optically active materials using optical devices | 3 | 3 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | 2 | - |
| | | CO4 | Explain the construction, working and applications of Lasers. | 3 | 2 | 3 | 3 | 2 | - | 3 | - | 2 | - | 2 | 2 | 2 | 2 | - |
| | | CO5 | To solve problem of one dimensional box using concepts of Quantum Mechanics | 2 | 3 | 2 | 2 | 2 | - | 2 | - | 2 | - | 2 | 2 | 2 | 2 | - |
| | | CO6 | Apply electromagnetic wave equations for different media and find out different parameters | 2 | 2 | 2 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | 2 | 2 | - |

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|---------------------|--------------------------------------|------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|---|
| MAH109B | MATHS LAB-I | CO1 | To perform basic mathematical calculations plotting the graphs and matrix operation using Ocatve | 1 | - | - | 3 | 3 | - | - | - | - | 2 | - | - | - | |
| | | CO2 | To evaluate derivative and its application using mathematical software | 1 | - | - | 3 | 3 | - | - | - | - | - | 2 | - | - | - |
| | | CO3 | To understand and apply concept of integration to evaluate area and volume using Mathematical software | 1 | - | - | 3 | 3 | - | - | - | - | - | 2 | - | - | - |
| | | CO4 | To compute the roots of quadratic,cubic & biquadratics equations and transformation of equations | 1 | - | - | 3 | 3 | - | - | - | - | - | 2 | - | - | - |
| SEMESTER-II | | | | | | | | | | | | | | | | | |
| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | |
| MAH110B | CALCULUS-II | CO1 | Explain physical meaning of gradient of a scalar field, curl, and divergence in terms of fluid flow and apply its concepts. | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 1 | - | |
| | | CO2 | Understand and apply reduction formulae and calculate length of an arc, area of a curve and volume & surface area of solid of revolution. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 1 | - |
| | | CO3 | Understand and apply the concept of beta and gamma functions to evaluate integrals. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | - |
| | | CO4 | Evaluate line integrals, surface integrals and volume integrals and relate Stokes, Divergence and Green's Theorems in other branches of Mathematics. | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | - |
| MAH111B | STATISTICS - I | CO1 | Compute measures of central tendency and solve related problems in real world | 3 | 2 | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 2 | - | 2 | |
| | | CO2 | Apply measures of dispersion to solve real world problems | 3 | 2 | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 2 | 2 | - | 2 |
| | | CO3 | Assess the shape and peakness of data and calculate the various methods of measurements | 3 | 2 | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 2 | 2 | - | 2 |
| | | CO4 | Apply correlation and regression techniques to check the dependency in data | 3 | 2 | 3 | 3 | 1 | - | 2 | - | 2 | 2 | 2 | 2 | - | 2 |
| | | CO5 | Develop confidence for self education and ability for life long learning | - | - | - | - | 2 | - | 2 | - | 2 | 2 | 2 | 2 | - | 2 |
| MAH112B | ORDINARY DIFFERENTIAL EQUATIONS | CO1 | Describe the concepts of ordinary differential equations and different types ODEs. | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | - | |
| | | CO2 | Effectively write mathematical derivation/ solutions of all types of ODEs in a clear and concise manner | 2 | 1 | 1 | 2 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | - |
| | | CO3 | Explain and apply various forms of Ordinary differential equations in the different areas of day to day life problems and solve them. | 3 | 3 | 2 | 1 | 2 | - | 2 | - | 2 | 2 | 2 | 2 | 2 | - |
| | | CO4 | Derive and apply the concept of method of variation of parameter, simultaneous linear differential equations in arising the physical problems.(Orthogonal trajectories, electric circuits, etc.) | 3 | 3 | 3 | 1 | 3 | - | 2 | - | 2 | 3 | 2 | 2 | 2 | - |
| MAH113B | GEOMETRY OF TWO AND THREE DIMENSIONS | CO1 | Analyse general equation of second degree eqn and apply concept focii, length & eqns of axes of to trace the conics. | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | - | - | - | |
| | | CO2 | apply the concept of confocal conics for classification of different conics | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | - | - | - | |
| | | CO3 | Apply the concepts of sphere and Cone to solve related mathematical problems | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | - | - | - | |
| | | CO4 | understand and analyse the properties of cylinder and central conicoids. | 2 | 1 | - | 2 | - | - | - | - | 2 | 2 | - | - | - | |

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| MAH114B | MATH LAB-II | CO1 | To construct the programming codes for solving mathematical problems. | 1 | - | - | 3 | 3 | - | - | - | - | 2 | - | - | - | | |
| | | CO2 | To analyze the statistical data by plotting the graph, pi-chart etc. | 1 | - | - | 3 | 3 | - | - | - | - | - | 2 | - | - | - | |
| | | CO3 | To analyze the statistical data in terms of measure of central tendency, dispersion, skewness, kurtosis and correlation regression. | 1 | - | - | 3 | 3 | - | - | - | - | - | 2 | - | - | - | |
| CHH137 | ENVIRONMENTAL SCIENCE | CO1 | Explain the multidisciplinary dimension of environmental issues | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - | - | |
| | | CO2 | Explain the environmental issues and suggest potential solutions | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO3 | Discuss about the various types of organisms and draw inferences about their interactions in different | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO4 | Defend the principles governing the interactions between social and environmental factors | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO5 | environmental settingsOrganize or create an environmental awareness event/article/campaign/eco-friendly product | - | 2 | - | - | - | - | - | - | - | - | 2 | 2 | - | - | - |

SEMESTER-III

| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PO13 | |
|--------------|-----------------|-----------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|---|
| MAH204B | REAL ANALYSIS | CO1 | Apply the field, order and completeness properties over the set of real numbers and its subsets. | 3 | 3 | 3 | 3 | 1 | - | 2 | - | 1 | 1 | 1 | - | - | |
| | | CO2 | Apply the properties of open and closed sets to analyze various subsets of R. | 3 | 3 | 3 | 3 | 1 | - | 2 | - | 1 | 1 | 1 | 1 | - | - |
| | | CO3 | Examine for the convergence of a real sequence. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 1 | 1 | 1 | - | - |
| | | CO4 | Examine for the convergence/divergence behavior of an | 3 | 3 | 3 | 3 | 1 | - | 2 | - | 2 | 1 | 1 | 1 | - | - |
| | | CO5 | Examine for the uniform convergence of sequence and series of functions. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 1 | 1 | - | - | - | - |
| MAH205B | STATISTICS - II | CO1 | Apply the concept of probability theory and probability distributions to solve related problems. | 2 | 2 | 2 | 3 | 2 | 1 | - | 2 | 1 | 1 | 1 | 1 | - | |
| | | CO2 | Apply the concept of Joint probability theory and Joint probability distributions to solve related problems. | 2 | 2 | 2 | 3 | 2 | 1 | - | 2 | 1 | 1 | 1 | 1 | - | |
| | | CO3 | Apply the concepts of some special discrete and continuous distributions to solve related problems. | 2 | 2 | 2 | 3 | 2 | 2 | - | 2 | 1 | 1 | 1 | 1 | - | |
| | | CO4 | Apply the knowledge of sampling theory to analyse and interpret given data. | 3 | 2 | 3 | 3 | 3 | 3 | - | 3 | 3 | 2 | 2 | 2 | 2 | 1 |
| MAH206B | GROUP THEORY | CO1 | Recognize the mathematical objects called groups and link the fundamental concepts of groups and symmetries of geometrical objects. | 3 | 2 | 3 | 1 | 1 | - | 3 | - | 3 | 2 | 2 | 2 | - | |
| | | CO2 | Explain the significance of the notions of cosets, normal subgroups, and factor groups and analyze consequences of Lagrange's theorem. | 3 | 2 | 3 | 1 | 1 | - | 3 | - | 3 | 2 | 2 | 2 | 2 | - |
| | | CO3 | Illustrate Permutation group and their applications | 3 | 2 | 3 | 1 | 1 | - | 3 | - | 3 | 2 | 2 | 2 | 2 | - |
| | | CO4 | Classify structure preserving maps between groups and their consequences. | 3 | 2 | 3 | 1 | 1 | - | 3 | - | 3 | 2 | 2 | 2 | 2 | - |
| | | CO5 | Understand the basic concepts of group actions and their applications | 3 | 2 | 3 | 1 | 1 | - | 3 | - | 3 | 2 | 2 | 2 | 2 | - |

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| MAH207B | PARTIAL DIFFERENTIAL EQUATIONS | CO1 | Understand the concepts of Partial differential equations ,order and degree of PDEs | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 3 | 2 | 3 | 3 | 2 | |
| | | CO2 | Explain various forms/types of Partial differential equations and their solutions | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 3 | 2 | 3 | 3 | 3 | 2 |
| | | CO3 | Apply various tools of Partial differential equations in various engineering problems and solve the problems | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 3 | 2 | 3 | 3 | 3 | 2 |
| | | CO4 | Define and apply the concept of method of separation of variable in arising the physical problems(heat and vibration of strings). | 3 | 2 | 3 | 3 | 2 | - | 2 | - | 3 | 2 | 3 | 3 | 3 | - |
| MAH208B | MATH LAB - III | CO1 | Install LaTeX and its related components on a home/personal computer. | - | - | - | - | - | - | - | - | 2 | - | - | - | - | |
| | | CO2 | Use LaTeX and various templates acquired from the course to compose Mathematical documents, presentations, and reports | - | 3 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| | | CO3 | Create mathematical documents containing mathematical expressions & formulas via LaTeX. | - | 3 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| | | CO4 | Compose articles in different journal styles. | - | 3 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| | | CO5 | Insert graphs and figures in LaTeX. Customize LaTeX documents. | - | 3 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| | | CO6 | Prepare presentations using LaTeX | - | 3 | - | - | - | 2 | - | - | - | - | - | - | - | - |
| MCS232 | Introduction to Finance | CO 1 | To take an overview of Financial management and its need to take financial decisions. | - | 1 | 1 | 1 | - | 1 | - | 1 | 2 | 2 | 2 | 1 | 1 | |
| | | CO 2 | To understand financial statements and distinguishes between profit & loss and Balance sheet of different business organizations. | - | 1 | 2 | 2 | - | - | - | 2 | 2 | 1 | 2 | - | 1 | |
| | | CO 3 | To identify the different sources of long term finance and differentiate amongst equity, preference and Debt | - | 1 | 1 | 2 | - | - | 1 | 1 | 1 | 1 | 1 | - | 1 | |
| | | CO 4 | To elaborate and apply various techniques of capital budgeting and analyse cost of capital and capital structure | - | 1 | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | - | 1 | |
| EDS288 | APPLIED PHILOSOPHY | CO1 | Examine the philosophical problems implicit in the experience of self, others and the society | - | - | 1 | 1 | - | - | - | 3 | 2 | 2 | - | - | - | |
| | | CO2 | Explore the philosophy of influential philosophers with respect to society, Science and success in life | - | - | - | 1 | - | - | - | 3 | 2 | 2 | - | - | - | |
| | | CO3 | Demonstrate the understanding of the concepts and theories of moral philosophy. | - | - | - | 1 | - | - | - | 3 | 1 | 1 | - | - | - | |
| | | CO4 | Reflect philosophically and ethically on one's own personal, professional and civic lives. | - | - | - | 1 | - | - | - | 3 | 2 | 2 | - | - | - | |
| | | CO5 | Formulate a philosophy of life or world-view consistent with the objectives of liberal society | - | - | 1 | 1 | - | - | - | 2 | 2 | 3 | - | - | - | |
| EDS289 | APPLIED PSYCHOLOGY | CO1 | To define psychology and its application across various fields. | - | 3 | - | - | - | - | - | 2 | 2 | 3 | - | - | 3 | |
| | | CO2 | To identify major attributes of Personality. | - | 3 | - | - | - | - | 1 | 2 | 1 | 3 | - | - | 3 | |
| | | CO3 | To conceptualize psychology in social and organizational settings | - | 3 | - | - | - | - | - | 3 | - | 3 | - | - | 2 | |
| | | CO4 | To understand group dynamics | - | 3 | - | - | - | - | - | 2 | 1 | 2 | - | - | 3 | |
| | | CO5 | To solve conflicts among the group | - | 3 | - | - | - | - | - | 2 | 1 | 2 | - | - | 3 | |

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| EDS290 | APPLIED SOCIOLOGY | CO1 | analyze the social cultural dynamics that contribute to transformation of Indian Society | - | 2 | - | - | - | - | - | - | - | - | - | - | |
| | | CO2 | develop the necessary skills of social processes which affect our everyday lives. | - | 3 | - | - | - | 2 | - | - | 1 | - | - | - | - |
| | | CO3 | study and analyse various contemporary issues of society and able to provide solutions of social barrier and benefiting the masses. | - | - | - | - | - | - | - | 3 | 1 | - | - | - | - |
| | | CO4 | develop basic research skills in the area of sociology and help to find possible solution of specific social barriers of the society | - | - | - | - | - | 2 | - | - | - | 2 | - | - | 2 |
| MCS231 | BASICS OF ECONOMICS | CO1 | To comprehend the economic problems of the society. | - | - | 1 | 1 | - | - | - | 1 | 1 | 1 | 1 | 1 | |
| | | CO2 | To enlighten the laws of utility, demand and supply and their measurement. | - | - | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | - | 1 |
| | | CO3 | To explain the laws of production and various concepts of costs. | - | - | 1 | 2 | - | - | - | 1 | 1 | 1 | 1 | - | 1 |
| | | CO4 | To elaborate the various market forms and the nature and characteristics of Indian economy | - | - | 1 | 2 | - | - | - | 1 | 2 | 1 | 2 | - | 1 |
| CDO203 | QUANTITATIVE APTITUDE – I | CO1 | Students will be able to analyze various forms of data | 1 | 2 | 3 | - | - | - | - | - | - | - | - | 13 | |
| | | CO2 | Students will be able to solve complex problems based on arithmetic reasoning. | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | 13 |
| | | CO3 | Students will be able to apply short tricks on complex problems of number system. | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | 13 |
| MAN209B | MINI PROJECT-I | CO1 | The student shall be able to describe research and its impact. | - | - | - | - | 3 | - | - | - | - | - | - | - | |
| | | CO2 | The student shall be able to identify broad area of research & analyze the processes and procedures to carry out research. | 2 | - | 2 | 2 | 3 | - | -- | - | 2 | - | 2 | 2 | - |
| | | CO3 | The student shall be able to use different tools for literature survey | - | - | - | - | 2 | 3 | - | - | - | - | - | - | - |
| | | CO4 | The student is able choose specific area/problem of research | 2 | - | 2 | 2 | 3 | - | - | - | - | - | 2 | 2 | - |
| | | CO5 | To understand and adopt the ethical practice that is to be followed in the research activities | - | - | - | - | - | - | - | 3 | - | 2 | - | - | - |
| | | CO6 | To prepare a draft of review/ research article. | - | 3 | - | - | - | - | - | - | 2 | 2 | 2 | 2 | - |
| FLS102 | GERMAN-I | CO1 | Students will be able to know the living standard of Germany and can learn the comparison with their native country like the types of houses Germans have and the type of houses they have in their country. | - | 3 | - | - | - | - | 1 | 3 | 2 | 1 | - | - | |
| | | CO2 | Students will be able to identify belongingness of the objects like what belongs to them or what belongs to someone else. | 1 | 3 | 1 | - | 1 | - | 1 | - | 1 | - | - | 1 | - |
| | | CO3 | Students will be able to describe their daily routine in German language. They will be able to learn timings as well. | 1 | 3 | 1 | - | 1 | - | 1 | - | 1 | - | - | 1 | - |
| | | CO4 | Students will be able to learn informal letter writing like they can mention their daily routine to their friend. | 1 | 1 | - | - | 2 | - | 1 | 2 | 2 | - | - | - | - |

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|--------|----------|-----|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FLS103 | FRENCH-I | CO1 | Exchange greetings and do introductions using formal and informal expressions. Understand and use interrogative and answer simple questions. | - | 3 | - | - | - | - | 1 | 3 | 2 | 1 | - | - | - | |
| | | CO2 | Learn Basic vocabulary that can be used to discuss everyday life and daily routines, using simple sentences and familiar vocabulary. Express their likes and dislikes. | 1 | 3 | 1 | - | 1 | - | 1 | - | 1 | - | - | 1 | - | - |
| | | CO3 | Describe themselves, other people, familiar places and objects in short discourse using simple sentences and basic vocabulary. | 2 | 3 | 2 | - | 2 | - | 3 | - | 1 | - | - | 1 | - | - |
| | | CO4 | Students will be able to understand audio text and comprehend to the same. They will be able to form paragraph using auxiliary verb and basic verbs. | 2 | 3 | - | - | 1 | - | 2 | - | - | - | - | 1 | - | - |
| | | CO5 | Students will be introduced to French culture and civilization. They will be able to describe various places and locations of Francophonic countries. | 1 | 1 | - | - | 2 | - | 1 | 2 | 2 | - | - | - | - | - |

SEMESTER-IV

| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | |
|--------------|-------------------|-----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|---|
| MAH210B | ADVANCED ANALYSIS | CO1 | Apply the concepts of Riemann Integrals to evaluate definite integrals. | 3 | 3 | 3 | 3 | - | 1 | 2 | - | 2 | - | - | - | - | |
| | | CO2 | apply various techniques to evaluate different kinds of Improper integrals. | 3 | 3 | 3 | 3 | - | 1 | 2 | - | 2 | - | - | - | - | - |
| | | CO3 | Explain different kinds of functions of complex variables and apply them for solving mathematical problems. | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | - | - | - | - | - |
| | | CO4 | Demonstrate and apply the concept of analytic functions for solving mathematical problems. | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | - | - | - | - | - |
| MAH211B | ADVANCED ALGEBRA | CO1 | Recognize and apply the Sylow theorems to characterize certain finite groups. | 3 | 2 | 3 | - | 2 | - | 2 | - | 2 | - | - | - | - | |
| | | CO2 | Understand & Apply the fundamental concepts of ring theory such as the concepts of ideals, quotient rings, integral domains, and fields. | 3 | 2 | 3 | - | 2 | - | 2 | - | 2 | - | - | - | - | - |
| | | CO3 | Learn in detail about Ring homomorphism, polynomial rings and their applications. | 3 | 2 | 3 | - | 2 | - | 2 | - | 2 | - | - | - | - | - |
| | | CO4 | Understand Fundamental properties of finite field extensions and classification of finite fields useful in advanced mathematical theories | 3 | 2 | 3 | - | 2 | - | 2 | - | 2 | - | - | - | - | - |
| MAH212B | MECHANICS-I | CO1 | Understand the concept and basic terms of Mechanics, Composition and resolution of forces. Parallel forces. Moments and Couples. | 3 | 2 | 3 | 3 | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 2 | |
| | | CO2 | Derive the mathematical solutions of all theorems / formulas of all topics in a clear and concise manner. | 3 | 3 | 3 | 2 | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 1 | |
| | | CO3 | Explain and solve analytical conditions of equilibrium of coplanar forces, Friction, Centre of Mass and Centre of Gravity, Virtual work, Forces in three dimensions and Poinots central axis. | 3 | 2 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| | | CO4 | Determine and apply mathematical equation of Wrenches, Null lines and planes. Stable and unstable equilibrium and solve the problems. | 2 | 3 | 1 | 2 | - | - | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 |

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| MAH213B | INTEGRAL TRANSFORMS & APPLICATION | CO1 | Calculate the Laplace and Inverse Laplace transforms and apply the same to solve differential and integral equations. | 3 | 3 | 2 | 3 | 1 | 1 | 2 | - | 2 | 1 | 1 | - | - |
| | | CO2 | Find the Fourier series expansion of a function. | 3 | 3 | 2 | 2 | 1 | 2 | 2 | - | 2 | 1 | 1 | - | - |
| | | CO3 | Compute the Fourier and Inverse Fourier transforms and apply the same to solve differential and integral equations. | 3 | 2 | 2 | 3 | 1 | 1 | 2 | - | 2 | 1 | 1 | - | - |
| | | CO4 | Compute Z-Transform and Inverse Z-Transform and apply the same to solve differential and integral equations. | 3 | 1 | 2 | 3 | 1 | 1 | 2 | - | 2 | 1 | 1 | - | - |
| MAH214B | SET & NUMBER THEORY | CO1 | Apply the concept of set and relation on pure and applied mathematics. | 3 | 3 | 2 | 3 | 2 | 1 | 2 | - | 2 | 1 | 2 | - | - |
| | | CO2 | Prove results involving divisibility and greatest common divisors | 3 | 3 | 3 | 3 | 2 | 2 | 2 | - | 2 | 1 | 2 | - | - |
| | | CO3 | Find integral solutions to specified linear Diophantine Equations. | 3 | 2 | 3 | 2 | 1 | 1 | 2 | - | 2 | 1 | 1 | - | - |
| | | CO4 | Apply Euler-Fermat's Theorem to prove relations involving prime numbers. | 3 | 2 | 3 | 2 | 1 | - | 2 | - | 2 | 1 | 1 | - | - |
| CSH210B | DATA STRUCTURES | CO1 | TO understand the concept of Dynamic memory management, algorithms and their complexity ; demonstrate the abstract properties and operations of Linear data structures (using Static Memory Allocation) : Array ; To apply different Searching and Sorting algorithms. | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| | | CO2 | Demonstrate the abstract properties and operations of Linear data structures (using Dynamic Memory Allocation) : Link List and variations of Linked List. | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | CO3 | Demonstrate the abstract properties and operations of Linear data structures (using Static & Dynamic Memory Allocation) : Stacks, Queues | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | CO4 | Demonstrate the abstract properties and operations of Non Linear data structures (using Static & Dynamic Memory Allocation) : Trees, Graphs | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| MAH215B | ACTUARIAL STATISTICS | CO1 | understand the role of statistical principles and their application in actuarial science | 1 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| | | CO2 | Demonstrate the necessary analytical skills for interpreting and analyzing actuarial and statistical information | 1 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| | | CO3 | Justify and communicate the necessary management skills for dealing with organizations, teams and policy issues, so as to be able to work independently and collaboratively to collect, process, interpret and communicate the outcomes of actuarial and statistical problems | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| | | CO4 | Demonstrate the skills necessary to critically engage with and evaluate actuarial and statistical problems | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 |
| MAH216B | SURVEY SAMPLING & INDIAN OFFICIAL STATS | CO1 | understand the concept of population and sample and estimate statistical attributes of both like mean, variances etc. | 3 | 1 | 2 | - | 3 | - | 1 | - | 3 | 3 | 3 | 2 | 3 |
| | | CO2 | apply Stratified random sampling technique | 3 | 1 | 2 | - | 3 | - | 1 | - | 3 | 3 | 3 | 2 | 3 |
| | | CO3 | apply Ratio and regression methods of estimation | 3 | 1 | 2 | - | 3 | - | 1 | - | 3 | 3 | 3 | 2 | 3 |
| | | CO4 | understand the methods of collection of official statistics and data handling. | 3 | 1 | 2 | - | 3 | - | 1 | - | 3 | 3 | 3 | 2 | 3 |

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|---------|-----------------------------|-----|--|---|---|---|---|---|---|---|---|---|---|---|----|----|
| MAH217B | QUNATITATIVE APTITUDE II | CO1 | Students will be able to analyze various forms of data | 1 | 2 | 3 | - | - | - | - | - | - | - | - | 13 | |
| | | CO2 | Students will be able to solve complex problems based on arithmetic reasoning. | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | 13 |
| | | CO3 | Students will be able to apply short tricks on complex problems of number system. | 1 | 2 | 3 | - | - | - | - | - | - | - | - | - | 13 |
| CSH234 | ESD | CO1 | Develop an inter-disciplinary understanding of sustainable development concerns and challenges | - | 2 | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO2 | propose and implement sustainable solutions to environmental issues (grow oyster mushrooms, develop a composting bin) | - | 2 | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO3 | understand the concept of sustainability initiatives & sustainability reporting and defend, criticize or compare the sustainability initiatives adopted by different enterprises and initiate a sustainability initiative/develop the sustainability report of the institute | - | 2 | - | - | - | - | - | - | 2 | 2 | - | - | - |
| | | CO4 | ustify the importance of contemporary issues like consumption, indigenous knowledge, gender issues, population in achieving sustainable development | - | 2 | - | - | - | - | - | - | 2 | 2 | - | - | - |
| ECS249 | E-WASTE | CO1 | Appreciate the scale of the e-waste problem and the legal framework for managing e-waste in your geographical or professional context. | 1 | 1 | 3 | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 1 |
| | | CO2 | Recognize the environmental, health and climate-related risks posed by e-waste as well as the potential value of e-waste. | 1 | 1 | 3 | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 1 |
| | | CO3 | Develop a project proposal to address an e-waste problem or opportunity that demonstrates some positive impact on environment, health, and climate change | 1 | 1 | 3 | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 1 |
| | | CO4 | Consider practical actions to take your learning from the course into the real world and help to raise public awareness. | 1 | 1 | 3 | - | - | - | - | 2 | 2 | 3 | 2 | 1 | 1 |
| LWS323 | CYBER LAW | CO1 | Undertand the concept of Cyber crimes and cyber Law | 2 | 1 | - | - | - | - | 2 | - | - | 1 | - | 3 | - |
| | | CO2 | Critically analyse the problems arising out of online transactions and find solutions | 3 | 2 | - | - | - | - | - | - | 2 | - | - | 1 | 1 |
| | | CO3 | Analyse Intellectual Property issues in the cyber sapace and apply relevant laws to protect or fight infingment | 3 | 1 | 2 | - | - | - | - | 1 | - | - | - | 2 | 1 |
| | | CO4 | Understand Information Technology Act 2000 and critically analyse various sections to apply such laws appropriately | 3 | 1 | - | - | - | - | - | - | - | - | - | 3 | 1 |
| MAN218B | MINI PROJECT-II | CO1 | The students will be able to critically evaluate the work done by various researchers relevant to the research topic | 2 | - | 2 | - | 3 | - | - | 1 | 2 | 2 | 2 | 2 | - |
| | | CO2 | To integrate the relevant theory and practices followed in a logical way and draw appropriate conclusions | 2 | - | 2 | - | 3 | 2 | 2 | - | 2 | - | - | - | - |
| | | CO3 | To understand the research methodologies/approaches/techniques used in the literature | - | 2 | - | - | 3 | 2 | 2 | - | 2 | 2 | 2 | 2 | - |
| | | CO4 | To structure and organize the collected information or findings through an appropriate abstract, headings, reference citations and smooth transitions between sections | - | 2 | - | - | 3 | - | - | - | 2 | 2 | 2 | 2 | - |

| SEMESTER-V | | | | | | | | | | | | | | | | | |
|--------------|--------------------|-----------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|---|
| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PO13 | |
| MAH301B | NUMERICAL ANALYSIS | CO1 | Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. | 3 | 1 | 3 | 2 | 3 | - | 2 | - | 3 | 2 | 3 | 2 | 3 | |
| | | CO2 | Apply numerical methods to obtain approximate solutions to mathematical problems. | 3 | 1 | 3 | 2 | 3 | - | 2 | - | 3 | 2 | 3 | 2 | 3 | 3 |
| | | CO3 | Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations. | 3 | 1 | 3 | 2 | 3 | - | 2 | - | 3 | 2 | 3 | 2 | 3 | 3 |
| | | CO4 | Analyse and evaluate the accuracy of common numerical methods | 3 | 1 | 3 | 2 | 3 | - | 2 | - | 3 | 2 | 3 | 2 | 3 | 3 |
| | | CO5 | Implement numerical methods in Real Life problems | 3 | 1 | 3 | 2 | 3 | - | 2 | - | 3 | 2 | 3 | 2 | 3 | 3 |
| | | CO6 | Solve & analyze the Mathematical problems related to Numerical Analysis and its applications using software | - | - | - | - | - | - | 3 | - | - | 3 | - | - | - | - |
| MAH302B | LINEAR ALGEBRA | CO1 | Apply the concepts of vector spaces, subspaces, bases, dimension and their properties in related mathematical problems and spaces. | 3 | 3 | 3 | 3 | 2 | 1 | 2 | - | 2 | 1 | 2 | - | - | |
| | | CO2 | Find Relationship between matrices and linear transformations apply the same in real world problems. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | - | 2 | 1 | 2 | - | - | |
| | | CO3 | Understand and apply the properties of inner product spaces and orthogonality in inner product spaces in related mathematical problems and spaces. | 3 | 2 | 3 | 2 | 1 | 1 | 2 | - | 2 | 1 | 1 | - | - | |
| | | CO4 | Recognise importance of adjoint of a linear transformation and its canonical form. | 3 | 1 | 3 | 1 | 1 | - | 2 | - | 2 | 1 | 1 | - | - | |
| MAH303B | METRIC SPACES | CO1 | understand and solve problems on metric space, open ball, sphere, interior, closed & open set, convergence | 3 | 2 | 3 | 2 | 3 | - | 2 | - | 2 | 1 | 1 | - | - | |
| | | CO2 | analyze and prove, theorems and problems related to completeness and compactness of a metric space. | 3 | 2 | 3 | 2 | 3 | - | 2 | - | 2 | 1 | 1 | - | - | |
| | | CO3 | analyze and prove, theorems and problems related to connectedness of a metric space. | 3 | 2 | 3 | 2 | 3 | - | 2 | - | 2 | 1 | 1 | - | - | |
| | | CO4 | recognise importance of metric spaces in mathematical sciences | 3 | 2 | 3 | 2 | 3 | - | 2 | - | 2 | 1 | 1 | - | - | |

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| MAH304B | INFORMATION THEORY AND CODING | CO1 | Demonstrate simple ideal statistical communication models. | 3 | 3 | 3 | 3 | - | - | 1 | - | 1 | 1 | 1 | 1 | - | |
| | | CO2 | Explain the development of codes for transmission and detection of information. | 3 | 3 | 3 | 3 | - | - | 1 | - | 1 | 1 | 1 | 1 | 1 | - |
| | | CO3 | Utilize various error control encoding and decoding techniques | 3 | 3 | 3 | 3 | - | - | 2 | - | 1 | 1 | 1 | 1 | 1 | - |
| | | CO4 | Apply information theory and linear algebra in source coding and channel coding | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | 1 | 1 | 2 | 2 | - |
| | | CO5 | Analyze the performance of error control codes. | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | 1 | 1 | 2 | 2 | - |
| CSH321B | INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS | CO1 | Acquire the knowledge about file systems, database concepts and structured query language. | 2 | 1 | 2 | 1 | - | - | - | - | 1 | - | 1 | 1 | - | |
| | | CO2 | Design, create and manage/manipulate database systems using SQL, Relational Algebra and Relational Calculus. | 3 | 1 | 3 | 2 | 3 | - | - | - | 2 | 1 | 3 | 2 | 2 | - |
| | | CO3 | Design ER Models and convert the same to relational model | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 2 | 3 | 2 | 2 | - |
| | | CO4 | Identify constraints, Design and Decompose the Database using Formal and Informal methods including FD, Normalization | 3 | 2 | 3 | 2 | 2 | - | - | - | 2 | 1 | 3 | 2 | 2 | - |
| | | CO5 | Understand the principles of Transaction Processing, Concurrency control methods and recovery techniques. | 1 | 1 | 2 | - | - | 1 | - | 1 | 1 | - | 2 | 1 | 1 | - |
| MAH305B | MATHEMATICS OF FINANCE | CO1 | Communicate the difference in capital budgeting decision tools like Net Present Values, Internal Rates of Return and Discounted Payback Periods; and Explain the details of arbitrage and its use in the valuation of forward contracts, including employing term structure of interest rates to | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 1 | - | - | 1 | |
| | | CO2 | Derive equations of value and various tools like linear interpolation & annuity tables; Define and describe in detail the use of cash flow models, simple and compound rates of interest and discount as well as compare and distinguish between nominal and effective rates of interest and discount. | - | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | - | 1 | |
| | | CO3 | Describe in detail the various types of annuities and perpetuities and use them to solve financial transaction problems. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | - | 1 | |
| | | CO4 | Define interest rate risk in terms of duration and convexity of fixed interest products, using this to define immunisation and assess its use in mitigating interest rate risk. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | - | 1 | |

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|--------------|------------------------|-----|--|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|---|
| MAH306B | STATISTICAL INFERENCES | CO1 | Test hypothesis for the parameters of normal distribution | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | |
| | | CO2 | Apply various test for categorical data. | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| | | CO3 | Apply tests for the significance of correlation coefficient | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| | | CO4 | Do analysis of variance & design experiments. | 1 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| MAH307B | MATH LAB-IV | CO1 | Obtain numerical solutions of algebraic and transcendental equations. | 1 | - | - | 2 | - | 3 | - | - | 3 | - | - | - | 1 | |
| | | CO2 | Find numerical solutions of system of linear equations and check the accuracy of the solutions | 1 | - | - | 2 | - | 3 | - | - | 3 | - | - | - | 1 | |
| | | CO3 | Learn about various interpolating and extrapolating methods. | 1 | - | - | 2 | - | 3 | - | - | 3 | - | - | - | 1 | |
| | | CO4 | Solve initial and boundary value problems in differential equations using numerical methods. | 1 | - | - | - | - | 3 | - | - | 3 | - | - | - | 1 | |
| | | CO5 | Apply various numerical methods in real life problems. | - | - | - | - | - | 3 | - | - | 3 | - | - | - | 1 | |
| MAN308B | MINOR PROJECT | CO1 | Identify broad area of research | 3 | 2 | 3 | 3 | 2 | 2 | 1 | - | 3 | 2 | 2 | 2 | - | |
| | | CO2 | Use different tools for literature survey | - | - | - | - | - | 3 | - | - | - | - | - | - | - | |
| | | CO3 | Analyze the processes and procedures to carryout research. | 3 | 2 | 3 | 3 | 2 | 2 | 1 | - | 3 | 2 | 2 | 2 | - | |
| | | CO4 | Work in groups with guidance. | - | - | - | - | - | - | - | - | - | 3 | - | - | - | |
| Total | | | | 82 | 64 | 91 | 80 | 61 | 31 | 46 | 5 | 77 | 42 | 56 | 33 | 32 | |

SEMESTER-VI

| Courses Code | Courses | Course Outcomes | CO Statement | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 |
|--------------|----------------------------------|-----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| MAH309B | LINEAR PROGRAMMING & GAME THEORY | CO1 | Demonstrate understanding the concepts and tools of linear programming problem & Game theory. | 3 | 1 | 2 | 3 | 2 | - | - | - | - | 2 | 2 | 1 | 1 |
| | | CO2 | demonstrate the problem on the basis of obtained solution of different problems of linear programming problem & Game theory with real world limitations/applications. | 3 | 1 | 2 | 3 | 2 | - | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| | | CO3 | To apply OR techniques constructively to make effective business decisions | 3 | 1 | 2 | 3 | 2 | - | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| | | CO4 | Analyse and construst the mathematical models used in Operations Research and learn to apply the restrictions on problems. | 3 | 1 | 2 | 3 | 2 | - | 1 | 1 | 1 | 2 | 2 | 1 | 1 |

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|---------|-------------------------|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAH310B | MECHANICS-II | CO1 | understand and use basic terms for the description of the motion of particles, vector functions and the fundamental laws of Newtonian mechanics | 3 | 2 | 3 | 3 | - | - | 2 | 2 | 2 | 2 | 2 | 1 | 2 | |
| | | CO2 | Apply kinetics relationships to systems of particles in curvilinear motion. | 3 | 3 | 3 | 2 | - | - | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 1 |
| | | CO3 | Analyze problems dealing with motion relative to rotating axes. | 3 | 2 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| | | CO4 | To demonstrate the principles and methods used in analyzing motion of a particle subjected to external forces. | 3 | 2 | 2 | 2 | - | - | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| MAH311B | DISCRETE MATHEMATICS | CO1 | To demonstrate concepts of partial order relation and lattices. | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | - | - | - | - | |
| | | CO2 | Apply basic counting techniques to solve combinatorial problems | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | - | - | - | - | |
| | | CO3 | Simplify Boolean functions by using the basic Boolean algebraic properties and K-map. | 3 | 3 | 3 | 3 | 1 | - | 2 | - | 2 | - | 1 | - | - | |
| | | CO4 | Apply algorithms and theorems that are treated in the course for solving graph theoretical problems. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | - | 1 | - | - | |
| | | CO5 | Solve & analyze the Mathematical problems related to Set POSET and Graph using mathematical software. | - | - | - | - | - | 3 | 1 | - | 2 | - | 2 | 3 | - | |
| MAH312B | MATHEMATICAL MODELING | CO1 | Understand the basics concept of Mathematical Modeling | 3 | 3 | - | 3 | 2 | 1 | - | - | - | 2 | 3 | 1 | - | |
| | | CO2 | Analyse the different techniques as per required area of modeling | 3 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | 3 | 1 | - | |
| | | CO3 | Solve the mathematical problems with the help of modeling tools | 3 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | 3 | 1 | - | |
| | | CO4 | Generate the differential mathematical model for different need | 3 | 3 | 2 | 3 | 2 | 1 | - | - | - | 2 | 3 | 1 | - | |
| MAH313B | APPLICATIONS OF ALGEBRA | CO1 | Construct Balanced incomplete block designs (BIBD) using various methods | 3 | 3 | 3 | - | 1 | - | 2 | - | 2 | - | 2 | - | - | |
| | | CO2 | Understand basics coding theory & applications | 3 | 3 | 3 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | - | |
| | | CO3 | Apply concepts of group theory on problems related to symmetry & colour patterns | 3 | 3 | 3 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | - | |
| | | CO4 | Know about different types of matrices and their applications in image processing & statistics | 3 | 3 | 3 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | - | |
| | | CO5 | Understand the applications of linear transformations in various areas and apply the same | 3 | 3 | 3 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | - | |
| | | CO6 | Apply linear algorithms for matrix factorization. | 3 | 3 | 3 | 2 | 1 | - | 2 | - | 2 | - | 2 | - | - | |

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|---------|-----------------------------------|-----|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAH314B | INDUSTRIAL MATHEMATICS | CO1 | have an enhanced knowledge and understanding of calculus differential equations, complex numbers in X-ray and CT scan. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 3 | 1 | 2 | |
| | | CO2 | Apply Fourier and inverse Fourier transforms and applications of their properties in image reconstruction | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 3 | 1 | 2 |
| | | CO3 | Apply pre-calculus, calculus, Matrices and differential equations in biological systems | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 3 | 1 | 2 |
| MAH315B | BIO MATHS | CO1 | Learn the development, analysis and interpretation of bio mathematical models | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 3 | 1 | 2 | |
| | | CO2 | Reinforce the skills in mathematical modeling. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 3 | 1 | 2 |
| | | CO3 | Appreciate the theory of bifurcation and chaos. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 2 | 3 | 1 | 2 |
| | | CO4 | Learn to apply the basic concepts of probability to molecular evolution and genetics. | 3 | 3 | 3 | 3 | 2 | - | 2 | - | 2 | 2 | 3 | 1 | - | |
| MAH316B | CRYPTOGRAPHY | CO1 | Understand the aspects of number theory which are relevant to cryptography. | 3 | 3 | 3 | 3 | - | - | 1 | - | 1 | 1 | 1 | 1 | - | |
| | | CO2 | Understand the difference between classical and modern cryptography | 3 | 3 | 3 | 3 | - | - | 1 | - | 1 | 1 | 1 | 1 | - | |
| | | CO3 | Understand and apply the concepts of fundamentals of cryptography, Data and Advanced Encryption Standards (DES & AES) and RSA. | 3 | 3 | 3 | 3 | - | - | 2 | - | 1 | 1 | 1 | 1 | - | |
| | | CO4 | Apply encryption and decryption techniques to encrypt and decrypt messages using block ciphers, sign and verify messages using well-known signature generation and verification algorithms. | 3 | 3 | 3 | 3 | - | - | 2 | - | 2 | 1 | 2 | 2 | - | |
| CSH322B | FUNDAMENTALS OF MACHINE LEARNING | CO1 | Demonstrate the understanding of a wide variety of supervised learning algorithms to solve classification and regression problems. | 3 | 1 | 3 | 2 | 2 | 3 | 2 | - | 1 | - | 1 | 1 | 1 | |
| | | CO2 | Demonstrate the understanding of a variety of unsupervised learning algorithms to solve clustering problems. | 3 | 1 | 3 | 2 | 2 | 3 | 2 | - | 1 | - | 1 | 1 | 1 | |
| | | CO3 | understand how to apply supervised learning and unsupervised algorithms to solve real world problems | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | |
| | | CO4 | understand how to perform evaluation of learning algorithms | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | |
| MCH393 | MANAGEMENT OF BANKING & INSURANCE | CO1 | To understand functions of financial intermediary institutions, including banks, investment banks and institutional investors as an important and contemporary area of financial management. | 1 | 2 | 1 | - | - | 2 | - | 1 | 1 | 2 | 1 | 1 | 1 | |
| | | CO2 | To train and equip the students with the dexterity of skills with which modern banking and insurance is run | 2 | 1 | 2 | 1 | - | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | |
| | | CO3 | To disseminate knowledge among the students inculcate with theoretical structures about banking and insurance. | 1 | 1 | 2 | 1 | 2 | 1 | - | 2 | 1 | - | 2 | - | 1 | |
| | | CO4 | Making a deep understanding on the workings of new issue market and secondary market | 2 | 1 | 2 | - | 2 | 1 | - | 2 | 2 | - | - | 1 | 1 | |

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| MAH317B | ECONOMETRICS | CO1 | Understand conceptualize econometric model, structure & estimation. | 2 | 2 | 1 | 3 | - | 2 | - | - | 1 | - | 2 | - | 1 | |
| | | CO2 | Able to do detection of multicollinearity | 2 | 2 | 1 | 3 | - | 2 | - | - | 1 | - | 2 | - | 1 | |
| | | CO3 | Able to apply Aitken estimators | 2 | 2 | 1 | 3 | - | 2 | - | - | 1 | - | 2 | - | 1 | |
| | | CO4 | Do tests & find solutions of heteroscedastic disturbances | 2 | 2 | 1 | 3 | - | 2 | - | - | 1 | - | 2 | - | 1 | |
| MCH109 | ENTREPRENEURSHIP THEORY & PRACTICE | CO1 | To acquaint the students with the fundamentals principles of Entrepreneurial theory & practices | 1 | 2 | 1 | - | - | 2 | - | 1 | 1 | 2 | 1 | 1 | 1 | |
| | | CO2 | To enable the students to prepare, analyze and interpret the start-up economy | 2 | 1 | 2 | 1 | - | 2 | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 2 |
| | | CO3 | To enable the students to take decisions using applicable tools and techniques. | 1 | 1 | 2 | 1 | 2 | 1 | - | 2 | 1 | - | 2 | - | 1 | |
| | | CO4 | To enable the students to take decisions using innovation & creative invention | 2 | 1 | 3 | - | 2 | 1 | - | 2 | 2 | - | - | 1 | 1 | |
| MAN318B | PROJECT | CO1 | Understand and adopt the ethical practice that are to be followed in the research activities as an individual or in team | - | - | - | - | - | - | - | 3 | 3 | - | - | - | 3 | |
| | | CO2 | Analyze the work done by various researchers relevant to the research topic. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | - | 2 | 2 | 3 | 2 | 1 | |
| | | CO3 | Integrate the relevant theory and practices followed in a logical way and draw appropriate conclusions. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | - | 2 | 2 | 3 | 2 | 2 | |
| | | CO4 | Structure, organize and present the collected information or findings through proper documentation and presentation. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | - | 2 | 2 | 3 | 2 | 1 | |