B. Tech. –I Sem.-I	L	T	P	C
ASM 101: Eng. Mathematics- I	**3**	**1**	**0**	**4**

- **CALCULUS** **(07 Hours)**
  Reorientation of calculus. Differentiation of Hyperbolic and Inverse Hyperbolic functions. Successive Differentiation, standard forms, Leibnitz's theorem and applications, Power series, Expansion of functions, Taylor's and Maclaurin's series.

- **APPLICATIONS OF DERIVATIVES** **(08 Hours)**
  Curvature, Radius of curvature, Cartesian, polar parametric curve with application in Engineering problems. Indeterminate forms, L'Hospital's rules.

- **ORDINARY DIFFERENTIAL EQUATION** **(08 Hours)**
  Reorientation of differential equation, Exact differential equation and Integrating factors, First order and higher degree odes, solvable for p, y and x, Modeling of Real world problems particularly Engg. System, spread of epidemic, spread of new technological innovations, RC and RL network.

- **CURVE TRACING** **(05 Hours)**
  Cartesian, polar and parametric form of standard curves.

- **BETA AND GAMMA FUNCTION** **(04 Hours)**
  Beta and Gamma function with their properties and duplications formula without proof.

- **APPLICATION OF DEFINITE INTEGRATION** **(05 Hours)**
  Area, arc length, surface area by revolving curve, volume by revolving area bounded by curve for Cartesian, polar and parametric curves.

- **MATRICES** **(07 Hours)**
  Elementary row and column transformation, rank of matrix, Linear dependence, consistency of linear system of equations, characteristic equation, Caley –Hamilton theorem, Eigen value, Eigen vector.

(Total Contact Time : 44 Hours)

BOOKS RECOMMENDED :

1. James Steward De Calculas, Thomson Asia, Singapore, 2003.
2. Bali and Iyengar. Engg. Mathematics, Laxmi Publications, New Delhi.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. J. N. Kapur , Mathematical Models in Biology and Medicine. East west Press, New Delhi 1985.
5. F. B. Hilderband, Methods of Applied mathematics, PHI, New Delhi, 1968

B. Tech.-I Sem.-II	L	T	P	C
ASM 201: Eng. Mathematics- II	**3**	**1**	**0**	**4**

- **DIFFERENTIAL CALCULUS** **(07 Hours)**
  Partial differentiation, Euler's theorem for homogeneous function, Modified Euler's theorem, Taylor's and Maclaurins series for two variables.

- **APPLICATIONS OF PARTIAL DIFFRENTATION** **(08 Hours)**
  Tangent plane and Normal line Error and Approximation, Jacobians with properties, Extreme values of function of two variables, Lagrange's methods of undetermined multipliers.

- **DIFFERENTIAL EQUATION OF HIGHER ORDER** **(08 Hours)**
  Solution of homogenous equations, complementary functions, Particular Integrals, Linear differential equation with variable coefficient, Cauchy's Euler and Legendre's equation with variable coefficient, Method of variation of parameters.

- **MATHEMATICAL MODELS** **(07 Hours)**
  Electrical network models, Detection of diabetes model and Bending beam models.

- **SERIES SOLUTION AND SPECIAL FUNCTIONS** **(07 Hours)**
  Regular point , Singular point, series solution of ODE of 2 nd order with variable coefficient with special emphasis to differential equation of Legendre's and Bessel's for different cases of roots of indicial equations.

- **LAPLACE TRANSFORM** **(07 Hours)**
  Laplace transform, Existance theorem, Laplace transform of derivatives and integrals, Inverse Laplace transform, Unit step functi ons, Dirac – delta functions , Laplace transform of periodic functions, Convolutions theorem, Application to solve simple linear and simultaneous differential equations.

(Total Contact Time: 44 Hours)

BOOKS RECOMMENDED :

1. E. Kreyszig : Advanced Engg. Mathematics. 8th Ed, John Wiley & Sons., New York.
2. Jain and Iyenger , Advanced Engg. Mathematics, Narosa Publications, New Delhi.
3. James Steward, Calculas, Thomson Asia, 5 edition, Singapore, 2003.
4. J. N. Kapur , Mathematical Models in Biology and Medicine, Eas t west press.
5. F. B. Hilderbrand , Methods of Applied Mathematics, McGraw Hill, New York

English and Communication Skills : ASE- 111
(Common to all branches) Semester -I / II

	Lecture	Tutorial	Practical
Teaching Hours	2	0	0
Exam. Scheme Marks			Internal Evaluation 50 End Sem. Exam 50

(A) THEORY:

1. Spoken English :
   Following Communic ative functions be discussed in meaningful natural dialogue forms: Greetings, Introductions, making request, Suggestions, Invitations, acceptance, refusal, seeking permission, giving a description, stating likes and dislikes, agreeing and disagreeing, stating performances, conversing on telephones, inquires, complains, compliments, encouragements, expressing thanks and apologies etc.(Audio Visual aids could be used for the above)

2. Written English :
   Business letters, Structures of business letter s, essential of good business letters, letters of enquiries, Complaints, Request etc. Report writing on general as well as scientific topics. Writing formal speeches for occasions like inauguration, introduction of guest speakers farewell etc, recording an d drafting of minutes of meetings.

(B) PRACTICALS / DRAWINGS+TUTORIALS ASSIGNMENTS: NILL

REFERENCES :

1. Krishna Mohan and Meera Banerji, "Developing Communication Skills" McMillan Co., 1990
2. N.Krishnaswami and T.Shariram, "Creative English Communication", McMillan Co., 1992
3. King and Cree " Modern Business Letters" Orient Longman, 1990
4. M.I.Joshi, "Let's Talk English" Gujjar Prakashan, Ahmedabad., 1995

B. Tech II (Computer), Semester – III	L	T	P	C
MH 203 : DISCRETE MATHS	**3**	**1**	**0**	**4**

- **GRAPH THEORY** **(08 Hours)**
  Graphs, Definition & basic concepts of finite & infinite graph, Incidence & Degree, Isomorphism, Subgraph, Walk, Path & circuits, Operations on graphs, c onnected graph, Disconnected graph & components, Complete graph, Regular graph, Bipertite graph, Euler's graph, Hamiltonian paths & circuits, Weighted graphs, Applications, Directed & Undirected graphs, Connectivity of graphs.

- **TREES** **(08 Hours)**
  Definition & properties of trees, Pendent vertices in a tree, Distance between two vertices Centre, Radius & diameter of a tree, Rooted & binary trees, Representation of Algebraic structure by Binary trees, Binary search trees, Spanning trees & fundamental circuits.

- **RELATION & LATTICES** **(08 Hours)**
  Definition & Basic properties, Graphs of relation, Matrices of relation, Equivalence relation, Equivalence classes, Partition, Partial ordered relation, Posets, Hasse diagram, Upper bounds, Lower bound, GLB & LUB of sets, Definition & properties of Lattice, Sub lattice, Distributive & modular lattices, complemented & Bounded Lattices, complete lattices & Boolean algebra

- **GROUP THEORY** **(08 Hours)**
  Basic properties of Group, Groupoid, semigroup & monoid, Abelian group, Subgroup, Cosets, Normal subgroup, Lagrange's theorem, Cyclic group , Permutation group, Homomorphism & Isomorphism of groups, Basic properties, error correction & detection code.

- **MATHEMATICAL LOGIC & PROGRAM VERIFICATION** **(12 Hours)**
  Propositions, logical operators & propositional algebra, Predi cates & quantifiers, Interaction of quantifiers with logical operators, Logical interference & proof techniques, Formal verification of computer programs (elements of Hoare logic).

(Total Contact Time : 44 Hours)

BOOKS RECOMMENDED:

1. Rosen K.H., 'Discrete Mathematics and Its Applications', McGraw Hill, 6 th Ed., 2006.
2. Kolman B., Busby R.C. & Ross S., 'Discrete Mathematical Structure', Prentice Hall of India Pvt. Ltd, 5th Ed, 2003.
3. Tremblay J. P. & Manohar R., 'Discrete Mathematical structure with applications to computer science', McGraw Hill, 1999.
4. Deo Narsingh., 'Graph theory with applications to Engineering & Computer Science' Prentice Hall of India Pvt. Ltd., 2000.
5. Liu C.L., 'Elements of Discrete Mathematics', McGraw Hill, 2000.

B. Tech II (Civil), Semester - IV	L	T	P	C
MH 210 : Engg. Mathematics III	**3**	**1**	**0**	**4**

- **CALCULUS, MULTIPLE INTEGRALS** **(08 Hours)**
  Reorientation of concepts of integrals, Double and Triple integrals, evaluation techniques, change of order of Integration, change of variable, Application of double and triple integrals for evaluation of area, volume and mass.

- **BASIC CONCEPTS OF VECTOR CALCULUS** **(08 Hours)**
  Line Integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meaning of gradient, divergence, curl and Laplacian with their properties, Surface Integral, Volume integral, Green's ,Gauss and Stoke's theorem & application.

- **FOURIER SERIES** **(06 Hours)**
  Definition, Fourier series with arbitrary period, in particular periodic function with period 2π . Fourier series of even and odd function, Half range Fourier series.

- **PARTIAL DIFFERENTIAL EQUATION** **(06 Hours)**
  Second order pde of mathematical physics (Heat, wave and Laplace equation, one dimensional with standard boundary conditions, solution by separation of variable method using Fourier series.

- **STATISTICS** **(06 Hours)**
  Correlation between two variable, application of correlation, evaluation of coefficients of correlation, Rank correlation, Regression, frequency distribution, Binomial, Poisson's distribution and Normal distribution, application to industrial problem.

- **TESTING OF HYPOTHESIS** **(05 Hours)**
  Test of significance, Chi-square (χ^2)test, student's t Test, application of the t -test, F-distribution.

- **TIME SERIES ANALYSIS** **(05 Hours)**
  Short term fluctuation, trend, Decision theory.

(Total Contact Time : 44 Hours)

BOOKS RECOMMENDED:

1. Kreyszing E., 'Advanced Engineering Mathematics', John Wiley & Sons, Singapore, Int. Student Ed. 1995.
2. Wiley C. R., 'Advanced Engineering Mathema tics', McGraw Hill Inc., New York Ed. 1993.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. Greenbar Michael D., 'Advanced Engg. Mathematics', Pearson, Singapore, Ind. Ed. 2007.
5. Ramana D. V., 'Higher Engg. Mathematics', The MaGraw-Hill Inc., New Delhi, 2007.

B. Tech II (Computer), Semester - IV	L	T	P	C
MH 210 : Engg. Mathematics III	**3**	**1**	**0**	**4**

- **BASIC CONCEPTS OF INTEGRALS VECTOR CALCULUS (04 Hours)**
  Reorientation of concepts of integrals, line Integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meaning of gradient, divergence, curl and Laplacian with their properties.

- **FOURIER SERIES (06 Hours)**
  Definition, Fourier series with arbitrary period, in particular periodic function with period 2π . Fourier series of even and odd function, Half range Fourier series.

- **FOURIER TRANSFORM AND FOURIER TRANSFORM OF AN INTEGRAL (06 Hours)**
  Fourier transform and its operational properties, Fourier Integral theorem, Fourier Cosine and solution, transform of derivatives, Inversion formula for Fourier transforms.

- **COMPLEX VARIABLES (06 Hours)**
  Basic mathematical concept, Analytic function, Cauchy – Riemann equations, Harmonic functions, its applications, Linear transformation of complex domain, bilinear transformations, conformal mapping and its application, complex integration over closed contour.

- **BASIC OF STATISTICS AND PROBABILITY DISTRIBUTION (06 Hours)**
  Reorientation of random experiments, events, probability and its distributions of Binomial & Poisson's, their properties and Normal distribution, jointly distributed random variables, expected values, function of random variable moments, moment generating functions.

- **SAMPLING THEORY AND ESTIMATION (07 Hours)**
  Some basics of sampling, statistical inference, Random Samples, Sampling distribution, Sample mean, variance and other statistics, point estimate and interval estimate confidence of interval, maximum likehood estimate.

- **TESTING OF HYPOTHESIS (07 Hours)**
  Sampling and Test of significance, Statistical hypothesis and significance, Type I and Type II errors, Test of significance. Level of Significance, single tail and two tail tests hypothesis Chi-square (χ^2)test, student's t Test of significance of the mean of a random sample,t-test for difference of means of two small samples, Snedecor's variance ratio test or F-test and tis applications.

(Total Contact Time : 42 Hours)

BOOKS RECOMMENDED:

1. Kreyszing E., 'Advanced Engineering Mathematics', John Wiley & Sons, Singapore, Int. Student Ed. 1995.
2. Wiley C. R., 'Advanced Engineering Mathema tics', McGraw Hill Inc., New York Ed. 1993.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. Greenbar Michael D., 'Advanced Engg. Mathematics', Pearson, Singapore, Ind. Ed. 2007.
5. Ramana D. V., 'Higher Engg. Mathematics', The MaGraw-Hill Inc., New Delhi, 2007.

B. Tech. II (CIVIL), Semester – III	L	T	P	C
MH 207: ENGINEERING ECONOMICS & MANAGEMENT	**3**	**0**	**0**	**3**

- **ECONOMICS: (12 Hours)**
  Introduction To Economics, Micro & Macro Economics, Applications & Scopes Of Economics, Demand Analysis, Demand Forecasting, Factors Of Production, Types Of Cost, Market Structures, Break Even Analysis, Concept Of Supply, National Income

- **MANAGEMENT: (16 Hours)**
  - Introduction To Management, Features Of Management, Nature Of Management, Development Of Management Thoughts – Scientific Management By Taylor & Contribution Of Henry Fayol, Coordination & Functions Of Management, Centralization & Decentralization, Decision Making
  - Fundamentals Of Planning
  - Objectives & MBO
  - Types Of Business Organizations: Private Sector, Public Sector & Joint Sector
  - Organizational Behavior: Theories Of Motivation, Individual & Group Behavior, Perception, Value, Attitude, Leadership

- **FUNCTIONAL MANAGEMENT: (12 Hours)**
  - Marketing Management: Core Concepts Of Marketing, Marketing Mix (4p), Segmentation – Targeting – Positioning, Marketing Research, Marketing Information System, Concept Of International Marketing, Difference Between Domestic Marketing & International Marketing
  - Personnel Management: Roles & Functions Of Personnel Manager, Recruitment, Selection, Training
  - Financial Management: Goal Of Financial Management, Key Activities In Financial Management, Organization Of Financial Management, Financial Institutions, Financial Instruments, Sources Of Finance

- **MODERN MANAGEMENT ASPECTS: (05 Hours)**
  Introduction To ERP, e – CRM, SCM, RE – Engineering, WTO, IPR Etc.

(**Total Contact Hours: 45 Hours)**

Books Recommended:

1. Prasad L.M., Principles & Practice Of Management, Sultan Chand & Sons, 1994
2. Banga T. R. & Shrama S.C., Industrial Organisation & Engineering Economics, Khanna Publishers,1995.
3. Robbins S., Organizational Behavior , Phi (Pearson), 1998
4. Kotler P., Keller, Koshi & Jha, Marketing Management – A South Asian Perspective, Pearson, 2007
5. Aswathapa K, Human Resource and Personnel Management, Tata McGraw Hill, 2001

B. Tech II (Chemical), Semester - III	L	T	P	C
MH 210 : Engg. Mathematics III	**4**	**1**	**0**	**4**

- **CALCULUS, MULTIPLE INTEGRALS** **(08 Hours)**
  Reorientation of concepts of integrals, Double and Triple integrals, evaluation techniques, change of order of Integration, change of variabl e, Application of double and triple integrals for evaluation of area, volume and mass.

- **BASIC CONCEPTS OF VECTOR CALCULUS** **(08 Hours)**
  Line Integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meaning of gradient, divergence, curl and Laplacian with their properties, Surface Integral, Volume integral, Green's ,Gauss and Stoke's theorem & application.

- **FOURIER SERIES** **(06 Hours)**
  Definition, Fourier series with arbitrary period, in particular periodic function with period 2π. Fourier series of even and odd function, Half range Fourier series.

- **PARTIAL DIFFERENTIAL EQUATION** **(06 Hours)**
  Second order pde of mathematical physics (Heat, wave and Laplace equation, one dimensional with standard boundary conditions, solution by separation of vari able method using Fourier series.

- **FOURIER INTEGRAL & TRANSFORM** **(06 Hours)**
  Fourier Integral theorem, Fourier sine and cosine integral complex form of integral, Inversion formula for Fourier transforms, Fourier t ransforms of the derivative of a function, Application of Fourier transforms to boundary value problems.

- **COMPLEX VARIABLES** **(08 Hours)**
  Basic mathematical concept, Analytic function, C – R equations, Harmonic functions, its applications, Linear transformation of complex domain, some special transformation, bilinear transformations, conformal mapping and its ap plication, complex integration including contour integration.

- **ELEMENTS OF STATISTICS & PROBABILITY** **(08 Hours)**
  Correlation between two variable, application of correlati on, evaluation of coefficients of correlation, Rank correlation, Regression, frequency distribution, Binomial, Poisson's distribution and Normal distribution, application to industrial problem, Test of significance, Chi -square χ^2 test, student's t Test, application of the t-test, F-distribution.

(Total Contact Time : 50 Hours)

BOOKS RECOMMENDED:

1. Kreyszing E., 'Advanced Engineering Mathematics', John Wiley & Sons, Singapore, Int. Student Ed. 1995.
2. Wiley C. R., 'Advanced Engineering Mathematics', McGraw Hill Inc., New York Ed. 1993.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. Greenbar Michael D., 'Advanced Engg. Mathematics', Pearson, Singapore, Ind. Ed. 2007.
5. Ramana D. V., 'Higher Engg. Mathematics', The MaGraw -Hill Inc., New Delhi, 2007.

B. Tech II, (Electrical), Semester – III	L	T	P	C
MH 210 : Engg. Mathematics III	**3**	**1**	**0**	**4**

- **CALCULUS, MULTIPLE INTEGRALS** **(08 Hours)**
  Reorientation of concepts of integrals, Double and Triple integrals, evaluation techniques, change of order of Integration, change of variable, Application of double and triple integrals for evaluation of area, volume and mass.

- **BASIC CONCEPTS OF VECTOR CALCULUS** **(08 Hours)**
  Line Integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meaning of gradient, divergence, curl and Laplacian with their properties, Surface Integral, Volume integral, Green's ,Gauss and Stoke's theorem & application.

- **FOURIER SERIES** **(06 Hours)**
  Definition, Fourier series with arbitrary period, in particular periodic function with period 2π. Fourier series of even and odd function, Half range Fourier series.

- **FOURIER INTEGRAL & TRANSFORM** **(06 Hours)**
  Fourier Integral theorem, Fourier sine and cosine integral complex form of integral, Inversion formula for Fourier transforms, Fourier transforms of the derivative of a function.

- **PARTIAL DIFFERENTIAL EQUATION** **(06 Hours)**
  Second order pde of mathematical physics (Heat, wave and Laplace equation, one dimensional with standard boundary conditions, solution by separation of variable method using Fourier series, Solution by Separation of variables & transformation techniques.

- **COMPLEX VARIABLES** **(10 Hours)**
  Basic mathematical concept, Analytic function, C – R equations, Harmonic functions, its applications, Linear transformation of complex domain, some special transformation, bilinear transformations, conformal mapping and its application, complex integration including contour integration.

(Total Contact Time : 44 Hours)

BOOKS RECOMMENDED:

1. Kreyszing E., 'Advanced Engineering Mathematics', John Wiley, Int. Student Ed. 1995.
2. Wiley C. R., 'Advanced Engineering Mathematics', McGraw Hill, Int. Student Ed. 1993.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. Greenbar Michael D., 'Advanced Engg. Mathematics', Pearson, Singapore, Ind. Ed. 2007.
5. Ramana D. V., 'Higher Engg. Mathematics', The MaGraw -Hill Inc., New Delhi, 2007.

B. Tech.II (Mechanical & Production), Semester –IV	L	T	P	C
MH 210: ENGG. MATHEMATICS – III	**4**	**1**	**0**	**5**

- **CALCULUS, MULTIPLE INTELRALS** **(08 Hours)**
  Reorientation of concepts of integrals, Double and Triple integrals evaluation techniques, Change of order of Integration, Change of variable, Application of double and triple integrals for evaluation of area, volume and mass.

- **BASIC CONCEPTS OF VECTOR CALCULU S** **(08 Hours)**
  Line Integrals, Scalar and vector point function, Differential operator, Gradient, Directional derivative, Physical meaning of gradient, Divergence, Curl and Laplacian with their properties, Surface Integral, Volume integral, Green's ,Gauss and Stoke's theorem & application .

- **FOURIER SERIES** **(06 Hours)**
  Definition, Fourier series with arbitrary period , in particular periodic function with period 2π. Fourier series of even and odd function, Half range, Fourier series.

- **PARTIAL DIFFERENTIAL EQUATION** **(08 Hours)**
  Second order PDE of mathematical physics (Heat, wave one dimensional equation and Laplace equation with standard boundary conditions), Solution by separation of variable method using Fourier series.

- **INTRODUCTION TO ENGINEERING ANALYSIS** **(06 Hours)**
  Types of problems encountered in Mechanical Engineering, Classification of problems based on methods of solution.

- **SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS** **(12 Hours)**
  Euler's method, Runge-Kutta method, Boundary value and eigen value problems, Application to mechanical engineering problems, Taylor's series and Predictor-Corrector method.

- **FINITE DIFFERENCE METHOD** **(12 Hours)**
  Methods to derive finite difference equations, Elliptic and parabolic equations, Boundary conditions, Explicit and Implicit method, Application to mechanical engineering problems

(Total Lecture Hours: 60 Hours)

BOOKS RECOMMENDED:

1. E. Kreyszing, "Advanced Engineering Mathematics", John Wiley, International Student Edition, 1995
2. Peter O'Neel, "Advance Engineering & Mathematics", Thompson (Singapore) Indian Edition, 2002
3. Michael D. Greenber, "Advance Engineering Mathematics", Pearson (Singapore) Indian Edition, 2007
4. S.S. Chapra & R.P. Canale, "Numerical Methods for Engineers", McGraw Hill International edition, 2002
5. K. S. Rao, "Numerical Methods for Scientists and Engineers", Prentice -Hall India, 2nd Edition, 2004
6. N. K. Raju & K. U. Muthu, "Numerical Methods for Engineering Problems", Macmillan India Ltd., 2nd Edition, 2005

B. Tech II, (Electronics), Semester – III	L	T	P	C
MH 210 : Engg. Mathematics III	**3**	**1**	**0**	**4**

- **CALCULUS, MULTIPLE INTEGRALS** **(08 Hours)**
  Reorientation of concepts of integrals, Double and Triple integrals, evaluation techniques, change of order of Integration, change of variable, Application of double and triple integrals for evaluation of area, volume and mass.

- **BASIC CONCEPTS OF VECTOR CALCULUS** **(08 Hours)**
  Line Integrals, scalar and vector point function, differential operator, gradient, directional derivative, physical meaning of gradient, divergence, curl and Laplacian with their properties, Surface Integral, Volume integral, Green's ,Gauss and Stoke's theorem & application.

- **FOURIER SERIES** **(06 Hours)**
  Definition, Fourier series with arbitrary period, in particular periodic function with period 2π. Fourier series of even and odd function, Half range Fourier series.

- **FOURIER INTEGRAL & TRANSFORM** **(06 Hours)**
  Fourier Integral theorem, Fourier sine and cosine integral complex form of integral, Inversion formula for Fourier transforms, Fourier transforms of the derivative of a function.

- **PARTIAL DIFFERENTIAL EQUATION** **(06 Hours)**
  Second order pde of mathematical physics (Heat, wave and Laplace equation, one dimensional with standard boundary conditions, solution by separation of variable method using Fourier series, Solution by Separation of variables & transformation techniques.

- **COMPLEX VARIABLES** **(10 Hours)**
  Basic mathematical concept, Analytic function, C – R equations, Harmonic functions, its applications, Linear transformation of complex domain, some special transformation, bilinear transformations, conformal mapping and its application, complex integration including contour integration.

(Total Contact Time : 44 Hours)

BOOKS RECOMMENDED:

1. Kreyszing E., 'Advanced Engineering Mathematics', John Wiley, Int. Student Ed. 1995.
2. Wiley C. R., 'Advanced Engineering Mathematics', McGraw Hill, Int. Student Ed. 1993.
3. O'Neil Peter., 'Advanced Engg. Mathematics', Thompson, Singapore, Ind. Ed. 2002.
4. Greenbar Michael D., 'Advanced Engg. Mathematics', Pearson, Singapore, Ind. Ed. 2007.
5. Ramana D. V., 'Higher Engg. Mathematics', The MaGraw -Hill Inc., New Delhi, 2007.

B. Tech. III (All Branches) Semester V	L	T	P	C
Interdisciplinary Elective				
MH 305 : Marketing Management	3	0	0	3

- **Introduction** **(04 Hours)**
  Introduction to Marketing, Core concepts of Marketing Scope of Marketing, 4P of Marketing, Various concepts in Marketing

- **Developing Marketing Strategies and Plan** **(03 Hours)**
  Marketing and Customer value, Corporate and division strategic planning, Business unit strategic planning, product planning

- **Gathering information and scanning environment** **(03 Hours)**
  Internal records and marketing intelligence, analyzing macro environment, demographic environment, other major macro environment

- **Marketing Research and Demand forecasting** **(04 Hours)**
  Marketing research system, Marketing research process , methods of demand forecasting

- **Creating customer value, satisfaction and loyalty** **(04 Hours)**
  Building customer value, satisfaction and loyalty, Customer life time value, Customer Relationship Management (CRM), Customer database and database marketing

- **Analyzing Consumer Market and Business Market** **(06 Hours)**
  Factors influencing consumer behavior, Psychological process, Buying decision, Organizational buying, Business buying process, Purchasing / procurement process, stages in business buying process, Business to Business CRM, Institutional and Government market

- **Segmentation – Targeting – Positioning** **(06Hours)**
  Levels of market segmentation, basis for segmenting consumer market and business market, targeting, positioning

- **Brand Management** **(04 Hours)**
  Role and scope of brand, brand equity, Building and measuring brand equity, branding strategy

- **Product, Price, Promotion and Place (distribution) strategies** **(08 Hours)**
  Product characteristics and classifications, differentiation, Pricing concepts, channel decision, distribution, retailing, wholesaling, logistics, Integrated marketing communication, sales promotion, advertising, public relations, direct marketing, personal selling, Designing and managing services etc.

- **New Product development strategy** **(02 Hours)**
  Challenges in new product development, process and strategy for new product development

- **International Marketing** **(04 Hours)**
  Difference between international marketing and domestic marketing, global market etc.

(**Total Contact Hours: 44 Hours)**

Books Recommended:

1. Kotler P, Koshy A, Jha M; Marketing Management – South Asian Perspective, Pearson, 12ed, 2007
2. Kotler P., Marketing Management, 11ed, Pearson (PHI)

B. Tech. III (All Branches) Semester VI	L	T	P	C
Interdisciplinary Elective				
MH 306 : Personnel Management	3	0	0	3

- **Introduction** **(03 Hours)**
  Introduction to Personnel management , Definitions, Functions of personnel manager, systems , objectives, role of human relations, qualities of a good personnel manager

- **Planning and organizing personnel function** **(03 Hours)**
  Personnel philosophy, personnel objectives, duties and responsibilities, Personnel policies, formal organization, forms of departmentalization, coordination and span of management, group behavior etc.

- **Leadership, motivation and job satisfaction & Morale** **(03 Hours)**
  Definitions, difference between leader and a manager, different approach of leadership, theories of motivation, job satisfaction, morale

- **Employee communication, control and audit** **(03 Hours)**
  Communication, process of communication, directions of communication, steps in control process, personnel audit

- **Procurement of personnel** **(08 Hours)**
  Man power planning, determination of personnel need, Recruitment and selection process

- **Performance appraisal** **(01 Hours)**
  Purposes of appraisal, factors affecting appraisal, criteria for performance appraisal, methods etc.

- **Training and Development** **(06 Hours)**
  Training, education and development, Principles of learning, Responsibility of Training and Development, Policy, Need and objectives of training, types and methods of training, Evaluation of training and development, Organization Development (OD)

- **Job change** **(02 Hours)**
  Resistance to change, job change plans, career planning, promotion , transfer, demotions, separations

- **Employee compensation** **(03 Hours)**
  Primary compensation, nominal and real; wages, determination of wages, factors, incentives

- **Labor welfare and social security** **(02 Hours)**
  Labor welfare, principles, labor welfare officer, social security, International Labor Organization (ILO)

- **Employee Discipline, Grievance, Trade unions & Industrial relations** **(04 Hours)**
  Meaning, causes of indiscipline, types of discipline, rules, causes of grievances, Model grievances procedure, definition of Trade union, Nature and s cope of trade union, functions of trade union, collective bargaining, Industrial relations, Industrial disputes, Methods to solve disputes, workers' participations in management etc.

- **Records and Research** **(02 Hours)**
  Records, Personnel research

- **Human Resource Development** **(02 Hours)**
  Definition, HRD methods, HRD process, HRD outcomes, Operating mode, HRD manager

(**Total Contact Hours: 44 Hours)**

Books Recommended:

1. Tripathi P.C., Personnel Management and Industrial Relations, Sultan Chand and Sons,
2. Ashwathappa K., Human Resource and Personnel Management, Tata McGraw Hill

B. Tech. IV (Computer), Semester – VIII	L	T	P	C
MH 206: ECONOMICS & BUSINESS MANAGEMENT	**3**	**0**	**0**	**3**

- **ECONOMICS: (08 Hours)**
  Introduction To Economics, Micro & Macro Economics, Applications & Scopes Of Economics, Demand Analysis, Demand Forecasting, Factors Of Production, Types Of Cost, Market Structures, Break Even Analysis, Concept Of Supply, National Income

- **MANAGEMENT: (10 Hours)**
  - Introduction To Management, Features Of Management, Nature Of Management, Development Of Management Thoughts – Scientific Management By Taylor & Contribution Of Henry Fayol, Coordination & Functions Of Management, Centralization & Decentralization, Decision Making
  - Fundamentals Of Planning
  - Objectives & MBO
  - Types Of Business Organizations: Private Secto r, Public Sector & Joint Sector
  - Organizational Behavior: Theories Of Motivation, Individual & Group Behavior, Perception, Value, Attitude, Leadership

- **FUNCTIONAL MANAGEMENT: (12 Hours)**
  - Marketing Management: Core Concepts Of Marketing, Marketing Mix (4p), Segmentation – Targeting – Positioning, Marketing Research, Marketing Information System, Concept Of International Marketing, Difference Between Domestic Marketing & International Marketing
  - Operations Management: Introduction To Operations Management, Types Of Operation Systems, Types Of Layouts, Material Handling, Purchasing & Store System, Inventory Management
  - Personnel Management: Roles & Functions Of Personnel Manager, Recruitment, Selection, Training, Industrial Dispute, Collective Bargaining
  - Financial Management: Goal Of Financial Management, Key Activities In Financial Management, Organization Of Financial Management, Financial Institutions, Financial Instruments, Sources Of Finance

- **MODERN MANAGEMENT ASPECTS: (04 Hours)**
  Introduction To ERP, e – CRM, SCM, RE – Engineering, WTO, IPR Etc.

- **OPERATIONS RESEARCH: (10 Hours)**
  - Introduction To OR, Approaches, Applications & Scope Of OR
  - Linear Programming: Basic Concepts, Formulation Of L P Models, Limitations Of LP, Graphical & Simplex Methods, Assignment Problems, Transportation Problems – Initial Basic Solution
  - Decision Theory
  - Queuing System
  - Simulation

(**Total Contact Hours: 44 Hours)**

Books Recommended:

1. Prasad L.M., Principles & Practice Of Management, Sultan Chand & Sons, 1994
2. Banga T. R. & Shrama S.C., Industrial Organisation & Engineering Economics, Khanna Publishers , 1995
3. Robbins S., Organizational Behavior , Phi (Pearson) , 1998
4. Kotler P., Keller, Koshi & Jha, Marketing Management – A South Asian Perspective, Pearson, 2007
5. Sharma S. D., Operations Research, Kedar Nath Ram Nath & Company , 2002

B. Tech - IV(EC), Semester – VIII	L	T	P	C
MH 404: INDUSTRIAL MANAGEMENT: THEORY AND PRACTICES (NEW)	**3**	**1**	**0**	**4**

- **ECONOMICS** **(06 Hours)**
  Introduction To Economics, Micro And Macro Economics, Applications And Scopes Of Economics, Demand Analysis, Demand Forecasting, Factors Of Production, Types Of Cost, Market Structures, Break Even Analysis.

- **MANAGEMENT** **(13 Hours)**
  Introduction To Management, Features Of Management, Nature Of Management, Development Of Management Thoughts: Scientific Management By Taylor And Contribution Of Henry Fayol, Coordination And Functions Of Management, Centralization And Decentralization, Decision Making.
  - Fundamentals Of Planning.
  - Objectives And MBO.
  - Types Of Business Organizations: Private Sector, Public Sector And Joint Sector.
  - Organizational Behavior: Theories Of Motivation, Individual And Group Behavior, Perception, Value, Attitude, Leadership.

- **FUNCTIONAL MANAGEMENT** **(20 Hours)**
  - Marketing Management: Core Concepts Of Marketing, Marketing Mix (4P), Segmentation – Targeting – Positioning, Marketing Research, Marketing Information System, Concept Of International Marketing, Difference Between Domestic Marketing And International Marketing
  - Operations Management: Introduction To Operations Management, Types Of Operation Systems, Types Of Layouts, Material Handling, Purchasing And Store System, Inventory Management.
  - Personnel Management: Roles And Functions Of Personnel Manager, Recruitment, Selection, Training, Industrial Dispute, Collective Bargaining.
  - Financial Management: Goal Of Financial Management, Key Activities In Financial Management, Organization Of Financial Management, Financial Institutions, Financial Instruments, Sources Of Finance.

- **MODERN MANAGEMENT ASPECTS** **(03 Hours)**
  Introduction To ERP, e – CRM, SCM, Re – Engineering, WTO, IPR, Etc.

(Total Contact Time: 42 Hours)

BOOKS RECOMMENDED:

1. Prasad L.M.,"Principles & Practice Of Management", Sultan Chand & Sons, 1994.
2. Banga T. R. and Shrama S.C.,"Industrial Organisation & Engineering Economics", Khanna Publishers, 1995.
3. Robbins S.,"Organizational Behavior", PHI(Pearson), 1998.
4. Kotler P., Keller, Koshi and Jha,"Marketing Management – A South Asian Perspective", Pearson, 2007.
5. Sharma S. D.,"Operations Research", Kedar Nath Ram Nath & Company, 2002.