B.E. 401 - ENGINEERING MATHEMATICS III

Unit I

Functions of complex variables : Analytic functions, Harmonic Conjugate, Cauchy-Riemann Equations, Line Integral, Cauchy's Theorem, Cauchy's Integral Formula, Singular Points, Poles & Residues, Residue Theorem , Application of Residues theorem for evaluation of real integrals

Unit II

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi , Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equatins by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods

Unit III

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit IV

Solution of Ordinary Differential Equations(Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability : Probability Mass function, Probability density function. Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution ,Gamma Distribution ,Beta Distribution ,Testing of Hypothesis |:Students t-test, Fisher's z-test, Chi-Square Method

Reference:

(i) Numerical Methods using Matlab by J.H.Mathews and K.D.Fink, P.H.I.
(ii) Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(iii) Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(iv) Numerical Methods using Matlab by Yang,Wiley India
(v) Pobability and Statistics by Ravichandran ,Wiley India
Mathematical Statistics by George R., Springer

FT- 402 Safety Management

Unit I
Role of functions of a Manager. Elements and function of Management. Management role, authority, responsibility & power. Delegation and decentralization of authority. History of safety management in India and abroad. Need for safety: legal, humanitarian, economic and social consideration.

Unit II
Accident, injury, dangerous occurrences, unsafe acts, unsafe conditions, hazards etc. Theories of accident occurrences. Principal of accident prevention scope and effect: Risk management. Safety inspection. Safety audit. Disaster control.

Unit III
PLANNING & ORGANISING FOR SAFETY: Definition, need, nature, principles, policy formulation and effective planning for safety.Organization structure of safety department.Safety officer – Qualification, responsibilities, duties & Power.Safety Committee –Structure & Functions.

Unit IV
Directing for safety, Role and functions of a leader.Communication with management, employees & Union.Managerial communication. Training of workers, supervisors & managers. Evaluation & review of training programme. Role of management, supervisors, and safety department in motivation & safety performance.

Unit V
Role of trade unions in safety and health. Safety suggestions schemes. Safety competitions, safety incentive schemes. Audiovisual methods. Other promotional methods. Direct & indirect cost of accidents. Information on safety, health and accidents. Analysis of information on accident.

References:
1. Accident Prevention manual for Industrial Operations, NSC, Chicago 1982.
2. Principles of Industrial managements by Kootaz & Donnel.
3. Brawn D. B. , system analysis & design for safety, Prentice Hall inc, New Jersey.
4. Lees, F.P., loss prevention in process industries, Butter worth's, New Delhi 1986

FT- 403 Rescue Equipments and Techniques

Unit I
Hydraulically and pneumatically operated tools and equipments:- Hydraulic Jack, Hydraulic Cutter, Hydraulic Expander. Air Lifting Bags, Electric Power Tools: - Electric Cutter, Electric Saw, Chain Saw etc.

Unit II
Small Gears: - Their types, Applications and working principal
Ladders: - Constructional features, Their types, Material and applications
Ropes: - Their types, material and applications.

Unit III
General Introduction- Emergency Rescue Tender, Water Tender, Foam tender, Multipurpose Tender Hydraulic Platform, Turn Table Ladder, Canteen Van and Ambulance;
Fire Extinguishers:- Their types & Applications.
Rescue by Ordinary Means:

Unit IV
Different types of Knots & Hitches and their applications in emergency
Carries & Drags: - Fireman carry, Two man carry, three man carry, four man carry, chair carry, stretcher carry and different types of Drags.
Rescue problems and their remedies: -
Rescue from High – rise buildings
Rescue from major disasters – Earthquake, Flood, Drought, Tsunami etc.
Confined Space Rescue
Rescue from Mines
Rescue from Fire incident

Unit V:
Respiratory Equipments: -
Respiratory Physiology: - Composition of Air, Breathing, Breathing Rate, Calculation of the capacity &
time duration of the B.A.Set. Artificial Respiration and their techniques, Renunciator
B.A. Set: - Their types, Constructional features, Working Principal and Applications.
Gas Masks: - Their types, Constructional features, Working Principal and Applications.

References:
1. The manual of fire ship – 6 – A by HMSO
2. Elementary principles of rescue by Got. Of India, ministry of Home Affairs
3. Rescue Service Manual by HMSO
4. Rescue –Civil defense handbook by HMSO
5. Rescue tender for Airfields by ISI
6. Relevant ISI special appliances and equipments
7. Manual of fireman ship book no. 244

List of Experiments (Pl. expand it):

Name of Practical

To study the Introduction of Fire

To study the different types of Extinguishers and its maintenance

To study the Rescue Tender and Foam Tender

To study Personal Protective Equipments

To study different types of Ropes, Knots & Hitches

To study different types of Ladders

To study the Breathing Apparatus

To study about Hand tools & Portable tools

FT- 404 Electrical Fire Safety

UNIT-I
Generation: - Different types of Generating Stations, their equipments, Possible Faults and safety measures.

UNIT-II
Transmission: - Transmission lines, their equipments, Possible Faults and safety measures.

UNIT-III
Distribution: - Substation their equipments, Possible Faults and safety measures.
Transformer: - Their types, Working Principal, Applications, Possible faults & Safety measures.

UNIT-IV
Electrical Safety Equipments: - Relay, Fuses, Circuit Breaker, Insulators – Their types and applications
Earthing : - Their methods and applications.
Insulation: - Their types and applications Static Electricity & its protection

UNIT-V

Indian Standards (General reading)
1. I.S. 2206 (Part – I) - 1962Specifications for flame-proof electric lighting fitting.
2. I.S. 3034 – 1961 Code of Practice for fire safety of industrial buildings Electrical Generating and distribution stations.
3. I.S. 1646 – 1961 Code of Practice for Fire Safety of Buildings (General) Electrical installations.
4. I.S. 2148 – 1968 Specifications for Flame Proof Enclosures of Electrical apparatus.

References:
1. Electricity Fire Risks – G.S. Hodges
2. N.F.P.A.
3. J.P. Handbook.
4. Estimating & Costing – S.L. Uppal

List of Experiments (Pl. expand it):
1. To study the various methods of earthing
2. To study the safety procedures in electrical maintenance work and also classify hazards
3. To study the static electricity
4. To study the sailent features of Transformer oil
5. To study the various causes of electrical fire
6. To study the firefighting and rescue in the presence of radiation hazards
7. To study the radioactive waste management

FT- 405 Pumping Machinery and Fluid Mechanics

UNIT-I
Principles of Hydraulic Machinery, Dynamic Section of Fluid, Dynamic force and torque executed by fluid jet on plain, curved stationary and moving vanes; Velocity Diagrams, work done by impact, pressure due to deviated flow. Pumps (Positive Displacement Pumps)Reciprocating pumps; Basic theory, types, construction, installation characteristics and operation and accessories.

UNIT-II
Centrifugal pumps and its characteristics. Other water lifting devices, Ejector pumps, Air-lift pump installation operation. Parallel–Series, Centrifugal pumps. Pump Section, Maintenance and application.

FLUID MECHANICS
UNIT III
HYDRAULICS : The flow of water through open channels, pipe hose and nozzles. Measures of flow, pressure and pressure drop. KINEMATICS OF FLUIDS FLOW : Type of flow, path lines and stream lines, equation of continuity, one dimensional method of flow analysis.

UNIT IV
DYNAMICS OF FLUID FLOW Energies-potential, pressure and kinetic, Momentum and energy equations for steady flow, Barnoulli's theorem and its applications.
FLUID MEASUREMENT: Pressure measurements, use of piezometers and static tubes, velocity measurements, use of pitch-tubes, current meters. Discharge measurement, use of venturimeter. Orifice meter etc.

UNIT V
DIMENSIONAL ANALYSIS :Dimensions and units; Dimensional homogeneity; Buckingham's II theorem, Laws of Similarity. FLOW IN PIPES :Friction losses in pipes; loses due to sudden enlargement and contraction, Hydraulic and energy gradient lines, siphon, pipes in series and parallel, branching of pipes. Water hammer problems.

References:
1. Pump Selection and application : Tyler C. Riches.
2. Pump Operators, Handbook : I.S. University of Science and Technology.
3. Fire Pumps and Hydraulics : I.E. Ditts and T.M. Harris.
4. Hydraulic Mechanics: Dr. J.Lal
5. Pumps and Blowers : Church and Lal
6. Manual of Fireman ship Book No.4
7. Hydraulics Machines : J.Lal
8. Fire-fighting Hydraulics : Purington
9. Hydraulics and Fluid Mechanics : P.N.Modi, Dr. S.M. Seth
10. A text-book of Hydraulics, Fluid Mechanics & Hydraulic Machines: R.S. Khurmi
11. Fluid Mechanics and Systems : S. Nagarathnam
12. Engineering Fluid Mechanics : K.L. Kumar
13. A Text Book on Hydraulics and Fluid Mechanics (Vol. 1) : Dr. V.G. Garde, R.M.Advani.

List of Experiments (Pl. expand it):

1. To study Centrifugal Pump Characteristics
2. To study force balances in a Static System.
3. To study Different Types of Flow.
4. To determine the loss of head in the fittings at the various water flow rates

FT- 406 Dot .Net

UNIT I

Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II

Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features Of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events, and using various Tolls

UNIT IV

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V

XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:

1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
3. Web Programming by Chris Bates, Wiley
4. XML Bible by Elliotte Rusty Harold ,
5. ASP .Net Complete Reference by McDonald, TMH.
6. DO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Pl. expand it):

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#

11. Working with Page using ASP .Net.
12. Working with Forms using ASP .Net
13. Data Sources access through ADO.Net,
14. Working with Data readers , Transactions
15. Creating Web Application.