Course Contents

| Category | Title | Code | Credits-4C | | | Theory Papers |
|---|---|---|---|---|---|---|
| Interdisciplinary | Entrepreneurship and Management Concepts | AU/FT/IP/ ME/TX-501 | L | T | P | Max.Marks-100 |
| | | | 3 | 1 | - | Min.Marks-35 Duration-3hrs. |

**Unit-I**: **System Concepts:** Types, definition & characteristics; supra & subsystems, key component; boundary & interface complexity; feedback (pull) & feed forward (push) controls, open flexible-adaptive system, computer as closed system, law of requisite variety; system coupling, stresses and entropy; functional & cross functional system; Steven Alter's nine element work system model and its comparison with IPO (input-processing-output) model, structure and performance of work systems leading to customer delight.

**Unit-II**: **Management:** Importance, definition and functions; schools of theories, knowledge driven learning organization and e-business; environment, uncertainty and adaptability; corporate culture, difficulties and levels of planning, BCG matrix, SWOT analysis, steps in decision making, structured and unstructured decision; dimensions of organizations, size/specialization, behavior formalization, authority centralization, departmentalization, span and line of control, technology and Minzberg organization typology, line, staff & matrix organization, coordination by task force, business process reengineering and process of change management, HR planning placement and training, MIS; attitudes and personality trait, overlap and differences between leader & manager, leadership grid, motivation, Maslow's need hierarchy and Herzberg two factor theory, expectation theory, learning process, team work and stress management.

**Unit-III**: **Marketing:** Importance, definition, core concepts of need want and demand, exchange & relationships, product value, cost and satisfaction (goods and services ) marketing environment; selling, marketing and societal marketing concepts; four P's, product, price, placement, promotion; consumer, business and industrial market, market targeting, advertising, publicity, CRM and market research.
**Finance:** Nature and scope, forms of business ownerships, balance sheet, profit and loss account, fund flow and cash flow statements, breakeven point (BEP) and financial ratio analysis, pay-back period, NPV and capital budgeting.

**Unit-IV: Productivity and Operations:** Productivity and standard of living, types of productivity, operations (goods and services) Vs project management, production processes and layouts, steps in method improvement, time measurement, rating and various allowances; standard time and its utility, predetermined motion and time method, concepts of product and process specification, TQM, cost of quality, introduction to lean manufacturing (JIT), QFD, TPM & six sigma quality.

**Unit V: Entrepreneurship:** Definition and concepts, characteristics, comparison with manager, classification, theories of entrepreneur, socio, economic, cultural and psychological; entrepreneur traits and behavior, roles in economic growth, employment, social stability, export promotion and indigenization, creating a venture, opportunity analysis competitive and technical factors, sources of funds, entrepreneur development program.
**References**:


1- Daft R; The new era of management; Cengage.
2- Bhat Anil, Arya kumar; Management: Principles ,Processes Practices; Oxford higher edu.
3- Davis & Olson; Management Information System; TMH.
4- Steven Alter; Information systems, Pearson, www.stevenalter.com
5- Kotler P; Marketing management;
6- Khan, Jain; Financial Management;
7- ILO; Work study; ILO.
8- Mohanty SK; Fundamental of Entrepreneurship; PHI.
9- Kuratko, Hoolgetts; Entrepreneurship; Theory Process practice; Cengage.

Course Contents

| Category | Title | Code | Credits 4C | | | Theory Papers |
|---|---|---|---|---|---|---|
| DC - 07 | Salvage & Evaluation of Fire Situation | FT - 502 | L | T | P | Max. Marks – 100 |
| | | | 3 | 1 | 0 | Min. Marks - 35<br>Duration – 3 hrs. |

SALVAGE AND EVALUATION OF FIRE SITUATION

UNIT I

Concepts of Salvage at Planning stage, Salvage Operation and difficulties encountered. Various items of equipment necessary in salvage operation.

UNIT II:

Evaluation of fire situation: Fire Loss Calculation, Flame Temp. Measurement, Calculation for heat release rate, Salvage operation in different types of occupancies slick Hotel, Hospitals, Departmental Stores and Basement god owns etc.

UNIT III:

Follow up action and Investigation of Fire Situation such as Structural Fire, Wild Fire and Automobile Fire etc.

Unit IV

Case Studies of Salvage operations in different types of occupancy.

**References**:


1. Manual of Firemanship, Part 6-A by H.M.S.O.
2. Report and Accounts by Fire Salvage Association of Liverpool Limited.
3. The Principles and Practice of Fire Salvage Operation by Fire Salvage association.
4. Loss prevention in Process of Industries, Vol. 1, 2 & 3, Frank P. Lees.
5. Power Plant Engineering – Dr. Mahesh Verma

Course Contents

| Category | Title | Code | Credits – 4C | | | Theory Papers |
|---|---|---|---|---|---|---|
| DID 04 | Machine Drawing and Design | FT - 503 | L | T | P | Max. Marks – 100<br>Min. Marks - 35<br>Duration – 3 hrs. |

MACHINE DRAWING AND DESIGN

UNIT I: Drawing conventions; drawing and dimensioning IS codes, sectional views and sectioning, surface finish and tolerances, representation of machine parts such as external and internal threads,slotted heads, square ends, and flat radial ribs, slotted shaft, splined shafts, bearings, springs, gears, s: Rivet heads and Riveted joints, types of welded joints and representation.

UNIT II: Assembly Machine Drawing: Cotter and Knuckle joints, pedestal and footstep bearings, IC engines, parts, piston and connecting rods.

UNIT III CAD Software for 2D and 3D Modeling: Basic concept, plotting technique, assembly and blowup of parts, bill of materials, product data and product life cycle management

UNIT IV: Basic design concepts, design process, stages/phases in design, flowchart, problem formulation, design considerations (strength, manufacturing, maintenance, energy, environment, economics and safety); design for recycle and reuse, Design and safety factors, standardization in design, selection of materials

UNIT V: Design of components subject to static loads: riveted joints, welded joints , threaded joints, knuckle and cotter joints.

**References**:

1. Bhat, ND; Machine Drawing; Charotar
2. Singh A; Machine Drawing; TMH
3. Agarwal and agrawal; Engineering Drawing; TMH
4. Shigley JE et al; Mechanical Engineering Desing, TMH
5. Kulkarni SG, Machine Design; TMH
6. Mubeen and Mubeen; Machine Design.
7. Luzzader WJ, Duff JM; Fundamental of Engg Drawing and Interactive Graphics; PHI.

**List of Experiments (Pl. expand it):**

Design and drawing of parts contained in the syllabus

Course Contents

| Category | Title | Code | Credits – 6C | | | Theory Papers |
|---|---|---|---|---|---|---|
| | | | L | T | P | |
| ES – 6 | Paramedics | FT – 504 | 3 | 1 | 2 | Max. Marks – 100<br>Min. Marks - 35<br>Duration – 3 hrs. |

PARAMEDICS

Unit-I Paramedics: Definition; qualities of duties, tasks of paramedics. Study of the human body and its various systems: Skeleton system, Muscular systems, Digestive system, Respiratory system, Circulatory system, Central Nervous system, Excretory system etc. and their functions. Practical study of this part to include demonstrations of the human body with structural details of its various parts as seen externally and examination of its install functions such as pulse, breathing, movements of the chest and abdomen, movements of various joints of the body with structural changes in the body parts while making three movements. Practical study of internal organs from the model of the human body including microscopic study of various body cells and organs.

Unit-II Study of a Human Casualty: Including history taking, making of a diagnosis based on symptoms as Narrated by the casualty and signs as observed by the paramedic. Checking temperature pulse, respiration, blood pressure, swellings, discoloration of the skin, wounds, deformities etc/to confirm the diagnosis.
Study of various types of burns and their complications in the indoor cases in burn word in the local government hospitals. Study of maintenance of various charts related to such casualties and their importance.

Unit-III Casualties with affected vital functions: Such as casualties in unconscious state, asphyxia, shock including their causes symptoms, signs and specific aspects of examination of such casualties and maintenance of records during their observation and care at the place incident and during transportations up to hospital.
Study of specific injuries to body parts controlling there functions with external and internal injuries of head chest and abdomen including causes and consequences of external and internal bleeding.

Unit-IV Paramedical care of various types of Casualties and their injuries such as wounds, burns, injuries of bones and joints, disturbances in vital function including cardiopulmonary resuscitation, artificial respiration by manual and instrumental methods, bandages, splints, correction of shock, arrest of bleeding, treatment of hyperpyrexia, use of anti/shock fluids and their administration, Observation and maintenance of such causalities.

Unit-V Casualty handling including observation, maintenance of observation charts, treatment administered, temperature-pulse-respiration records, application of suction, appropriate positioning of casualties affected by head injuries, chest injuries, abdominal injuries, bleeding, shock, asphyxia etc. Transportation of causalities on stretches, across plain ground, through obstacles, stretcher drill, loading and unloading of causalities in stretches and ambulances, Ambulance installations and their use in causalities during transportation etc.

Unit-VI Casualties affected by heat and cold, drowning, poisoning, pressure, altitude, inebriations, sound, explosions, nuclear radiations etc. Casualties affected in nuclear, chemical, biological warfare. Prevention, protection of effects on human bodies and their paramedical care. Bites of animals such as snakes, dogs and various insects and their paramedical care.

**References**


1. Gray's Anatomy
2. Cunningham's Manual of Practical Anatomy
3. Hamilton, Boyal and Messmani : Human Embryelogy
4. Morri's Human Anatomy
5. Bainddbridge and Mainsions: Principles of Physiology, Essentials of Human Physiology
6. McDowell: Halliburton's Handbook of Physiology and Biochemistry
7. Parson : Biochemistry in Relation to Human Physiology.
8. Burns : Introduction to Biphysics.
9. Findlay : Physical Chemistry for students of Medicine
10. Boyg : Text book of Pathology
11. Wintrobe : Haematology
12. Ghosh : Materia Medica
13. Burn : Practical Pharmacelogy
14. Medi : Medical Jurisprudence and Toxicology
15. Tayler's Medical Medical Jurisprudence, Vols. I & II
16. S. Smith : Forensic Medicine
17. Glaister : Medical Jurisprudence and Toxicology
18. B.N. Ghosh : A Treatise of Hygiene and Public Health
19. Nash : Ssurgical Physiology
20. Watson Jones : Fractures and Joint Injuries
21. Mercer : Orthopaedics Surgeon
22. Grey Turner : Operative Surgery
23. Mamilton Boiley : Physical signs in Clinical Surgery
24. Romani's and Nirhiner of Rose and Careless : Text Book of Surgery.
25. R.W. Jones Tone : A Test Hook of Midwifery.


**List of Experiments(Pl. expand it)**

1. To study the Respiratory System
2. To study the Digestive System
3. To study the Central Nervous System
4. To study the various types of Burns
5. To study the causes, consequences & treatment of Internal & External Bleeding
6. To study the various types of Bandages, Splints & Dressings.
7. To study various types of Bites & their Paramedical Care.
8. To study the measurement of Body Temperature & Blood Pressure.
9. To study the Cardiovascular System.
10. To study the causes & treatment of Poisoning and Unconsiousness.
11. To study the causes & treatment of Fracture.
12. To study the methods of handling & transportation of Victim.

Course Contents

| Category | Title | Code | Credits 6C | | | Theory Papers |
|---|---|---|---|---|---|---|
| | | | L | T | P | |
| DC – 8 | Fire Prevention & Protection Measures | FT - 505 | 3 | 1 | 2 | Max. Marks – 100<br>Min. Marks - 35<br>Duration – 3 hrs. |

Unit-I General Principles of Fire Prevention and Protection Measures:
Planning and Construction of the Building:
Site Planning considering the nature of the plant, building, equipment and processes from the stand point of safety and fire protection, where corrosive, poisonous, explosive and easily combustible materials are handled and processed. Type of construction fire walls, barricades etc. Fire separation, fire steps, segregation, isolation.

Unit-II Internal Planning and Combustion of Plants and Buildings:
Layout of hazardous pipe lines, vessels and equipment, planning of strategic points and selection of fire extinguishing device, Automatic, fire doors, fire, doors, wire glass windows, fire walls, parapeted to prevent spread of Fire through roofs, vertical cut offs, Exits, Guards and Guarding, floor platforms, path roadways, stairs, ventilation. Protection and devices for fire due to lightening.

Unit-III Water Supply and System:Installations using water:
1. Sprinklers 2. Drenchers,
3. Water spray projector systems 4. Rising mains-wet and dry.

Unit-IV Lighting: Lighting arrangement and minimum light required in domestic, commercial, industrial and public assembly occupancies etc. Emergency lighting systems.
Fire Protection Arrangement:
Fire appliances; Fire Warning system (Manual and Automatic) fixed fire-fighting installations: I. Foam System; II. Gas/Vapour System; III. Dry Powder System; IV. Special Safety Protection Equipment-Explosion detection, venting and suppression system, Inergen clean agent system and F.M. 200.

Unit-V Safety and Fire Protection Organization:
(a) House-Keeping and management;
(b) Plant Fire Brigade and fire-fighting facilities, petrol, systems.

Unit-VI Detailed analysis of fire case studies, especially those fires where large number of people have been involved. Interaction and relative value of the components of escape route design, especially smoke movement and control.

**References**:

1. General Fire Hazards and Fire Protection by J.J. Williams.
2. Fire Prevention Notes for Industrial Premises by F.P.A.
3. Fire Prevention Hand Book by Kesteren Fire Brigade
4. Fire Prevention Standard Recommendations by Earnest Beam Ltd.
5. Automation – A challenge to Fire Protection Engineers by Warre J. Baker.
6. Fire Protection – Technical Information and Useful General Knowledge by Mather and Platt.
7. Hand Book of Fire Protection by N.F.P.A.
8. Fire Protection in Factory Buildings by H.M.S.O.
9. Fire Safety in Building by Adam and Chalres Black
10. Crosby – Fiske – Forster Hand Book of Fire Protection.
11. Industrial Fire Hazards by Danna and Milne
12. Fire Protection for the Design Professional by Rolf Jensen
13. Introduction to Fire Science and Fire Protection by William K. Bare

**List of Experiments(Pl. expand it)**

1->To Study of :

- **a.** Water Type Extinguisher
- **b.** Mechanical Foam Type Extinguisher
- **c.** CO2 Type Extinguisher
- **d.** DCP Type Extinguisher

On the basis of working principle, IS Code, mode of Operation & Maintenance.

2->To study the major component of Hydrant System on the basis of discharge rate, pressure requirement and percentage of piping.

3->To Study the Mode of Operation in Sprinkler Systems:

a. Wet Pipe System
b. Dry Pipe System
c. Deluge System

4->To study the hand held LX Foam Making branch pipe on the following basis.

a. Working Principle
b. Diagrams

Discharge and Pressure Requirement(as per HMSO)

5->To Study the General Requirements of Different type of Occupancy as per NFPA 101-Life Safety Code

6->To study the fixed DCP Installation as per NFPA Code 17

7->To study the Fire Fighting Properties of Foam Concentrate

a. Fuel Tolerance
b. Burn back resistance
c. Induction Ratio
d. Fluidity
e. Film Formation

8->To Study the CO2 Total Flooding System as per IS Specification

Course Contents

| Category | Title | Code | Credits 2C | | |
|---|---|---|---|---|---|
| NECC-4 | Engg. Workshop Practice | FT - 506 | L | T | P |
| | | | 0 | 0 | 4 |

ENGG. WORKSHOP PRACTICE

**Unit I Black Smithy Shop:** Smithy forges, maintenance and control of fire and fuel used in smithy shop. Use of various smithy tools such as sewage block, Anvil, different types of Hammers, Tongs, Flatters, Cold set, Hot set, Hydraulic swages, fullers, set hammers punches, Drifts and rivet headers (rivet snaps) etc.,Use of measuring foot rule, Callipers (outside and inside), Templates and gauges used in forging, Introduction to forging and forging methods heating metals for forging.

**Forging operations**: Upsetting, Drawing down, Fullering, Swaging, Platening, Cutting down, Forge welding, Punching and drafting.

Three jobs to cover above course such as

Forging of chisel.

Forging of C-Ring.

Forging of Pan Hook (S-shaped)

Forging of screw driver

Forging of hexagonal nut etc.

Unit II Fitting Shop:

Metal bench work Measuring instruments, Engineer steel rule, Surface gauges calliper, Hermaphrodite calliper (Jenny calliper), Height gauges, feeler gauges, Try square and micrometer.

Use, Care and maintenance of hand tools such as hammer, Cold chisel of different type, Center punch, Hack-saw, Dot punch, Drift, Different types of files, File cuts, File grades, Use of surface plate, Surface gauges type of drills, Taps and dies for drilling tapping and screw threads.

Fitting operations: Chipping filling, Drilling and tapping.

Two joints to cover above course such as :

Preparation ofjob piece by making use of filling, sawing and chipping operation.

Job having combined-practice for drilling and tapping.

Job having combined practice for drilling and reaining.

Unit III Advance Fitting: One composite job related to advance fitting covering knowledge about allowances and limits, Fits and tolerances. Use and care of important precision tools used in fitting.

Unit IV Welding: Students are required to make three jobs related to Brazing, Soldering and welding and to know about :

- Equipment used for Branzing, Solering and gas Arc welding.
- Selection of material and flux used in branzing and soldering
- Selection of welding rods, flux and pipe for gas welding.
- Selection of welding machine, Electrods and current for Arc welding.
- Use of tools and dequipments, Safety precautions.

**References**


1. Manufacturing Processes - Chapman, Vol. I & II.
2. Production Technology - P.N. Rao.
3. Workshop Technology - Raghuwanshi, Vol. I & II.
4. Workshop Practices - Hazara Choudhary, Vol. I & II.
5. Production Technology - R.K. Jain.

Course Contents

| Category of Course | Course Title | Course Code | Credits – 2C | | |
|---|---|---|---|---|---|
| NECC - 5 | Field Training in Fire Rescue | FT - 507 | L | T | P |
| | | | 0 | 0 | 2 |

FIELD TRAINING IN FIRE RESCUE

V SEMESTER

Rescue Drill

Unit – I Rescue from fire.

Unit –II Rescue from the accidents (Road side, railway accident & Aircraft), Electrocution & rescue from well.