

## Basic Automobile Technology

Course code	20KUA1C01	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### Course objectives:

- The fundamentals of principles of actual automobile systems.
- Understand the importance and features of different systems like axle, differential, brakes, Steering, suspension, and balancing etc
- The working of various automobile systems and sub systems.

### Course outcomes (CO):

CO1	Realize the Construction, working and other fine points of Internal Combustion Engines used in automobiles.	K2
CO2	Attain the concept of automotive transmission system	K1 & K2
CO3	Explicate the working principle of transmission and components of driveline system.	K2
CO4	Understand the need of tyre and various braking system in automobile	K2

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M		S	S	S	L	L
CO2	S	S	S	M	M		S	S	S	L	L
CO3	S	S	M	M	S		S	S	S	L	L
CO4	S	S	M	M	S		S	S	S	L	L

S – Strong; M – Medium; L - Low

### UNIT - I

Constructional details of spark ignition (SI) and compression ignition (CI) engines. Working principles. Two stroke SI and CI engines – construction and working. Comparison of SI and CI engines and four stroke and two stroke engines. Engine classification, firing order. Otto, diesel and dual cycles.

### UNIT - II

Clutch – Types and Construction – Gear Boxes, Manual and Automatic Types and Construction – Simple Floor Mounted Shift Mechanism – Over Drives – Transfer Box– Propeller shaft – Slip Joint – Universal Joints – Differential and Rear Axle – Hotchkiss Drive and Torque Tube Drive.

### **UNIT - III**

Requirement of Suspension System, Types of Suspension Springs, Constructional details and characteristics of Single Leaf, Multi-Leaf spring, Coil and Torsion bar Springs, Rubber, Pneumatic and Hydro – elastic Suspension Spring Systems, Independent Suspension System, Shock Absorbers, Types and Constructional details of Leaf and Coil Springs.

### **UNIT - IV**

Basic construction of chassis, Types of Chassis layout, with reference to Power Plant location and drive, various, types of frames, Types of Front Axles and Stub Axles. Steering system – Ackerman’s and Davi’s Steering Mechanisms - principle of steering – front end geometry – castor, camber, king pin inclination, toe-in, toe-out on turns – steering gear box – types – Over Steer and Under Steer and Power Steering.

### **UNIT - V**

Types and Construction of Hydraulic Braking System, Mechanical Braking System, Pneumatic Braking System, Power-Assisted Braking System, Servo Brakes – antilock braking systems(ABS) - Wheels and Tyres.

### **Text Book:**

1. Dr. Kirpal Singh, “Automobile Engineering”, Vol 1&2, 13th Edition, Standard Publishers, New Delhi, 2020.
2. Prof. R.B. Gupta, “Basic Automobile Engineering “, Satya Publishers, New Delhi, 2016.

### **Reference Book:**

1. John B.Heywood, “Internal Combustion Engine Fundamentals”, 1st edition, McGraw Hill Education, India, 2017.
2. Er. R .K Rajput, “A Textbook of Automobile Engineering”, Laxmi Publications, Chennai, 2017.

## Automotive Electrical and Electronics

Course code	20KUA1C02	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	I

### Course objectives:

- Fathom the construction and applications of Electrical and electronics components in various automotive electrical circuits.
- Identify, demonstrate and compare the various components and systems of Automotive electrical and electronics system.
- Ascertain the concepts and develop basic skills necessary to diagnose automotive electrical problems.

### Course outcomes (CO):

CO1	Enumerate the basic terminologies, components and concepts of Automotive electrical and Electronics systems in automobiles	K1&K2
CO2	Explain the construction, characteristics and maintenance of starting and ignition system	K2
CO3	Enlighten purpose, circuits, construction and working of components of lighting and accessories system.	K2
CO4	Interface automotive sensors, actuators with microcontrollers and various future technologies of vehicle.	K2 & K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S		S	S	S	M	L
CO2	S	S	S	M	M		S	S	S	S	M
CO3	S	S	S	M	M		S	S	S	S	M
CO4	S	S	S	M	S		S	S	S	S	M

S – Strong; M – Medium; L – Low

### UNIT-I

Ohm's law- Kirchoff's Law - voltage, power, current (AC/DC), resistance, Capacitors, magnetism and electromagnetic induction, vehicle earthing - Electrical symbols - electrical

safety procedures – Wiring and lighting circuits and their components – Different types of Batteries – principle, rating, testing and charging.

## UNIT-II

Charging system and its components – Starting system and its components – Types of starter motors and its drives – Different Types ignition systems – Diagnose troubles in starting system – Carry out various tests on starter motor – Servicing of starter motor – Diagnose troubles in charging system–Carry out various tests in charging system–Servicing of alternator.

## UNIT-III

Lighting system: insulated and earth return system, details of head light and side light, LED lighting system, head light dazzling and preventive methods – Horn, wiper system and trafficator. DC Generators and Alternators their characteristics. Control unit – cut out, electronic regulators. Spark plugs. Advance mechanisms. Electronic fuel injection systems, mono and multi point fuel injection system, Air conditioning system

## UNIT-IV

Current trends in automotive electronic engine management system, electromagnetic compatibility, electronic dashboard instruments, onboard diagnostic system, security and warning system, Fingerprint technologies, Types of sensors, Wind screen washers & wipers, Headlight wipers & washers, Engine cooling fan motors. Electronic speed control

## UNIT-V

Anti theft system, keyless entry system, Immobilizer system design, voice warning system, road navigation system, Smart Cars and Traffic system, Wi-Fi cars, blue Tooth, Applications, Vision Enhancement, Microprocessor and microcomputer controlled devices in automobiles such voice warning system, travel information system, Electronic protection system, electronic steering system.

### Text books:

1. Babu A. K, “Automotive Electrical and Electronics “, 2<sup>nd</sup> Edition, Khanna Publishers, 2018
2. Dr. Kirpal Singh, “Automobile Engineering”, Vol 1 & 2, 13<sup>th</sup> Edition, Standard Publishers, New Delhi, 2020.

### Reference Book:

1. Tom Denton , “Automobile Electrical and Electronic Systems”, 5<sup>th</sup> Edition, Routledge Publisher, 2017.
2. William B.Ribbens, “Understanding Automotive Electronics: An Engineering Perspective, Eighth Edition, Elsevier Inc, 2017.

## Automobile Technology and Maintenance

Course code	20KUA2C03	Credits	04	Year	I
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	II

### Course objective:

- Understand the complete knowledge of the vehicle maintenance procedures and acquire skills.
- Understand the functional of each system, Component and aggregate (Including both Mechanical and Electrical aggregates) of a Vehicle.
- Identify and change vehicle components requiring change due to continuous wear and tear (including oil and air filters in the engine aggregate).

### Course outcomes (CO):

CO1	Understand diagnose procedures: repairing, overhauling and troubles in petrol and diesel engine and sub system.	<b>K2&amp;K3</b>
CO2	Enlighten the principle of cooling & various lubrication systems.	<b>K2</b>
CO3	Understand the fundamentals, principle of operation and Performance of various clutches, gear boxes, Axles, etc.,	<b>K4</b>
CO4	Illustrate the basic concepts of steering, brake, suspension and wheel maintenance.	<b>K2 &amp; K4</b>

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S		S	S	S	S	S
CO2	S	S	M	S	M		S	M	S	M	L
CO3	S	S	M	S	M		S	S	S	M	L
CO4	S	S	S	M	S		S	S	S	M	L

S – Strong; M – Medium; L – Low

### UNIT - I

**Petrol Engine- Working principle** – Major components – Petrol supply system and its components – Carburetor – Petrol pump and injectors of MPFI engine – Various sensors and its uses – **Diagnosing troubles in petrol supply system.**

## **UNIT - II**

Diesel Engine- Working principle - Major components - Diesel supply system and its components - Individual injection system - Diesel pump - Injectors - Filters - CRDI - Air supply system - Air cleaners - Diagnosing troubles in diesel supply system.

## **UNIT - III**

Cooling system and its components - Types of cooling systems - Coolants used - Antifreeze solution - Lubrication system and its components - Types of lubrication systems - Types of lubricants - Properties and SAE grade of lubricating oils - Diagnosis of troubles in cooling system and lubricating system.

## **UNIT - IV**

Clutch - Types - Function - Fluid flywheel - Torque convertor - Hydraulic assisted clutch - Clutch adjustments - Gear box - Types - Functions - Constant mesh gear box - Synchromesh gear box - Manual and automatic gear boxes - Planetary gears. Transfer box - Trans axle arrangement - Propeller shaft and universal joints - Rear axle and differential - Final drives - Diagnosing troubles in clutch, gear box and rear axles.

## **UNIT - V**

Steering system - Types - Components - Rack and pinion, Worm and sector and re-circulating ball and nut steering gear boxes - Electronics control of steering system - Wheel alignments. Suspension systems - Conventional suspension - Independent suspension system for front and rear wheels - Types of springs and shock absorbers - Stability control - Air suspension with electronic control - Diagnosing troubles in steering system and suspension system.

### **Text Book:**

1. Dr. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, 13th Edition, Standard Publishers, New Delhi, 2020.
2. K.K Jain, R.B Asthana "Automobile Engineering", McGraw Hill Education; 1st edition, 2017.

### **Reference Book:**

1. Jigar A. Doshidhruv U. Panchaljayesh P. Maniar, "Vehicle Maintenance and Garage Practice", PHI Learning Pvt. Ltd., 2014.
2. Ed May, "Automotive Mechanics Volume One" and Two, Mc Graw Hill Publications, 2009.

## Advanced Automobile Technology

Course code	20KUA3C04	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	III

### Objectives:

- Acquire knowledge of alternate fuels.
- Illustrate the new generation vehicles and their operation and controls
- Describe the advanced vehicles and their operation and controls.

### Course outcomes (CO):

CO1	Understand the availability of alternate fuels and other alternate Energy sources.	K2
CO2	Make out the advanced engine function concepts.	K1 & K2
CO3	Understand the Emission norms, standards and emission control systems.	K2
CO4	Understand the recent development and technologies of Automobile Engineering.	K2

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M		S	M	S	M	M
CO2	S	M	M	S	M		S	S	S	M	M
CO3	S	M	M	M	S		S	M	S	M	L
CO4	S	S	M	S	S		S	S	S	M	L

S – Strong; M – Medium; L – Low

### Unit - I

Introduction to **alternative fuels**. - Need for alternative fuels - **Availability of different alternative fuels for SI and CI engines** - Various vegetable oils and their important properties - Different methods of using vegetable oils engines - Performance in engines - Performance, Emission and Combustion Characteristics in diesel engines.

### Unit - II

Air assisted Combustion, Homogeneous charge compression ignition engines - Hydrogen, Compressed Natural Gas, Liquefied Petroleum Gas and Bio Diesel - Properties, Suitability, Merits and Demerits - Engine Modifications.

### **Unit - III**

Layout of an **electric vehicle**, advantage and limitations, specifications, system components, electronic control system, high energy and power density batteries, **hybrid vehicle, fuel cell vehicles, solar powered vehicles.**

### **Unit-IV**

**Emission norms - EURO, USA, JAPAN and INDIA** - Controlling of pollutants from engine - catalytic converters - Char coal canister control for evaporative emission - Positive crank case ventilation system for Un-burnt hydro carbon emission reduction - Fumigation EGR (Exhaust gas recirculation) - Silencer design on sound reduction in automobiles - Exhaust gas analyzer - Smoke meter - Smoke emissions from engines.

### **Unit-V**

Preparation and maintenance of proper road network - National highway network with automated roads and vehicles - **Satellite control of vehicle operation for safe and fast travel, GPS.**

#### **Textbook:**

1. S Srinivasan, "Automotive Mechanics" Mc Graw Hill Publications, 2017.
2. Dr. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, 13th Edition, Standard Publishers, New Delhi, 2020.

#### **Reference Book:**

1. Heinz, "Modern Vehicle Technology" Second Edition, Bu.
2. R. K. Rajput, "A Text Book of Automobile Engineering". Publisher, Firewall Media, 2011.



## Automobile Repair and Maintenance

Course code	20KUA3C04	Credits	05	Year	II
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	III

### Objectives:

- Understanding the complete knowledge of the vehicle procedure and acquire skills in handling situations where the vehicle is likely fail.
- Understand various types of maintenance of vehicles and features and applications.
- Analysis various Trouble shooting, fault tracing practices available in automobile
- Recognize the various methods of maintaining vehicles and their subsystems.

### Course outcomes (CO):

CO1	Understand the various methods of maintenance and techniques.	K2&K4
CO2	Demonstrate the maintenance procedure for automotive transmission systems.	K1 & K2
CO3	Illustrate trouble diagnosis procedure for lubrication and fuel delivery system.	K2
CO4	Developing the ideas on trouble diagnosis procedure for electrical and electronic systems in automobiles.	K2 & K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M		S	S	S	M	M
CO2	S	S	S	S	S		S	M	S	M	M
CO3	S	S	S	S	M		S	S	S	M	M
CO4	S	S	S	M	S		S	S	S	M	M

S – Strong; M – Medium; L – Low

### Unit-I

**Maintenance** – Need, importance, primary and secondary functions, policies – classification of maintenance work – vehicle insurance – basic problem diagnosis. Automotive service procedures – **workshop operations – workshop manual –** vehicle identification – Safety – Personnel, machines and equipment, vehicles, fire safety – First aid. Basic tools – special service tools – measuring instruments – condition checking of seals, gaskets and sealants. **Scheduled maintenance services – service intervals** – Towing and recovering.

## **Unit-II**

Basic construction of chassis – Types of Chassis layout – with reference to Power Plant location and drive – various types of frames, Loads acting on vehicle frame – Types of Front Axles and Stub Axles – Front Wheel Geometry – Condition for True Rolling Motion – Driving Thrust and its effects, torque reactions and side thrust, Hotchkiss drive, torque tube drive, radius rods and stabilizers, Propeller Shaft, Universal Joints, Constant Velocity Universal Joints, Final drive, different types of final drive, Worm and Worm wheel, straight bevel gear, spiral bevel gear and hypoid gear final drive. Differential principle – Constructional details of differential unit, Differential housings and Non-Slip differential, differential locks.

## **Unit-III**

**Dismantling of engine components and cleaning** – cleaning methods – visual and dimensional inspections – minor and major reconditioning of various components (like engines and fuel system, ignition systems, suspension system, Braking System, etc), reconditioning methods – engine assembly – engine tune up.– special tools used for maintenance and overhauling – Mechanical and automotive clutch and gear box servicing and maintenance and servicing of propeller shaft and differential system – Maintenance and servicing of suspension systems – Brake systems, types and servicing techniques. Steering systems – overhauling and maintenance. – **Wheel alignment – computerized alignment and wheel balancing.**

## **Unit-IV**

**Servicing and maintenance of fuel system of different types of vehicles – calibration and tuning of engine for optimum fuel supply** – Maintenance of cooling systems and its components – water pump, radiator, thermostat – anticorrosion and antifreeze additives. Lubrication maintenance – lubricating oil changing – greasing of parts. Vehicle body maintenance – minor and major repairs – Door locks and window glass actuating system maintenance.

## **Unit-V**

Batteries and power storage system, power-generating systems – electrical wire harness – lighting, ignition – electronic and air conditioning systems etc – energy recuperation systems – electronic active and passive safety – comfort and convenience supplementary restraint systems (SRS) – networking and other systems – electronic control unit – ECU / ECM and sensors – **Diagnosing troubles in Electrical and Electronics equipments.**

### **Text Books:**

1. Dr. Kirpal Singh, “Automobile Engineering”, Vol 1 & 2, 13th Edition, Standard Publishers, New Delhi, 2020.
2. Jigar A. Doshidhrav U. Panchaljayesh P. Maniar, “Vehicle Maintenance and Garage Practice”, PHI Learning Pvt. Ltd.,2014.

### **Reference Book:**

1. Tim Gills, “Automotive Service: Inspection, Maintenance, Repairing”, Cengage Learning, 2004
2. Bosch Automotive Handbook, Sixth Edition, 2004.

## TECHNICAL DRAWING

Course code	20KUA4C06	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

### Objectives:

- To develop in students, graphic skills for communication of concepts, ideas and design of engineering products.
- To expose them to existing national standards related to technical drawings.

### Course Outcomes (CO)

CO1	Apply the Skill in the Geometric construction.	K3
CO2	Understand and Develop the Orthographic and Isometric projections.	K2 &K3
CO3	Remember the symbols widely used in Electrical and Electronics circuits.	K1

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	L	M	M	S	M	L	L
CO2	M	S	M	L	M	M	S	M	L	L
CO3	S	S	M	L	S	M	S	M	L	L

S - Strong; M - Medium; L - Low

### Unit I - Geometrical construction

Triangle (Equilateral triangle, Right angle triangle, Isosceles triangle, Acute triangle) -Rectangle, Rhombus, Trapezium, Circles -Regular Polygons (Square, Pentagon, Hexagon, Heptagon, Octagon)-Parabola (Tangent method, Offset method)-Ellipse (Parallelogram method, Four centre method, Concentric circles method)-Hyperbola-Cycloids -Involutes -Helix -Spiral curves.

## **Unit II-Projections**

**Orthographic** (first angle and third angle) (10 simple exercises each) - **Isometric** (5 simple exercises) - Oblique (2D and 3D wire frame models) (3 simple exercises) - Blue print reading (Missing views - Missing Lines - Missing dimensions)

## **Unit III- Sectional View**

Types of sectional view (Full section, Half section, Aligned section, Offset Section, Revolved Section, Removed section) - Detailing view.

## **Unit IV -Electrical and Electronics Symbols**

Symbols of - DC armatures - alternators - field winding shunt, series and compound - relays - contactors - fuses - main switch - electric bell - earth - aerial - DPST - DPDT - TPST - Network link - ammeters - voltmeters - wattmeter - energy meters - frequency meters - power factor meters - timers - buzzers - transformers - auto transformers- Incandescent lamp- Fluorescent Lamp -Signal lamp- Push button- Fire alarm - Siren- Water Heater- Ceiling Fan- Exhaust Fan -

Resistors - inductors - capacitors - diodes - transistors - FET - SCR - UJT - DIAC - TRIAC - MOSFET'S - LOGIC GATES - AND - OR - NOT - NAND - NOR - EXOR

## **Unit V- Introduction to AutoCAD**

History of AutoCAD-Applications- Advantages over manual drafting - hardware requirements - software requirements - window desktop - AutoCAD screen interface - menus - toolbars - How to start AutoCAD - command groups - How to execute command - types of coordinate systems - absolute-relative-polar- Simple sketches (lines and curves)

### **Text Books:**

- 1) Gopalakrishnan K.R., "Engineering Drawing" (Vol I & II combined), Subhas stores, Bangalore -2007
- 2) Shah M.B., and Rana.B.C., " Engineering Drawing", Pearson, 2<sup>nd</sup> edition, 2009.

## Open Elective - I

1. Principles of management
2. Personality Development and Human Behaviour

### Open Elective I- PRINCIPLES OF MANAGEMENT

Course code	20KUG4EA1	Credits	4	Year	II
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	IV

#### Objectives:

- Study the evolution of Management, to study the functions and principles of management and to learn the application of the principles in an organization.

#### Course Outcomes (CO)

CO1	Understand the basic managerial functions of an organization	K1
CO2	Develop the leadership qualities and planning attitude	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M	L	M	M	S	S
CO2	M	M	M	S	M	L	S	S	S	S

S - Strong; M - Medium; L - Low

#### UNIT I: INTRODUCTION TO MANAGEMENT AND ORGANIZATIONS

Definition of Management - Science or Art - Manager - managerial roles and skills - Evolution of Management - Scientific, human relations, system and contingency approaches - Types of Business organization - Sole proprietorship, partnership, company-public and private sector enterprises - Current trends and issues in Management.

#### UNITII: PLANNING

Nature and purpose of planning - planning process - types of planning - objectives - setting objectives - policies - Planning Tools and Techniques - Decision making steps and process.

### **UNIT III: ORGANISING**

**Formal and informal organization** - organization chart - organization structure - types - Line and staff authority - departmentalization - delegation of authority - centralization and decentralization - Human Resource Management - HR Planning, Recruitment, selection, Training and Development, Performance Management.

### **UNIT IV: DIRECTING**

Meaning, Principles and Functions- Motivation - **motivation theories - motivational techniques** - job satisfaction - job enrichment - leadership - types and theories of leadership - communication - process of communication - barrier in communication - effective communication - communication and IT.

### **UNIT V: CONTROLLING**

System and process of controlling - budgetary and non-budgetary control techniques - use of computers and IT in Management control - **Productivity problems and management** - direct and preventive control - reporting.

### **TEXT BOOKS:**

1. Stephen P. Robbins & Mary Coulter, " Management", Prentice Hall (India) Pvt. Ltd., 10th Edition, 2009.
2. JAF Stoner, Freeman R.E and Daniel R Gilbert "Management", Pearson Education, 6th Edition, 2004.

## Open Elective I - PERSONALITY DEVELOPMENT AND HUMAN BEHAVIOUR

Course code	20KUG4EB1	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	VI

### Objectives:

- To update the knowledge of schools of psychology and recent trends of psychology.
- To be familiarized with the developmental changes in various development stages across the life span.
- To equip the knowledge of personality, intelligence, motivation, perception, learning and attitude.
- To understand the importance of developmental stages of psychology and Health Psychology in social work practice and be able to know the real life situations.

### Course Outcomes (CO)

CO1	Enhance the knowledge in the field of psychology.	K1 &K2
CO2	Importance of personality, intelligence, motivation, perception, learning and attitude in day to day life.	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M	L	S	M	S	S
CO2	L	L	L	S	M	L	S	M	S	S

S - Strong; M - Medium; L - Low

### UNIT - I

**Psychology:** Definition - **Schools of Psychology:** Structuralism, Functionalism and Gestalt - **Recent trends:** Biological, Psychodynamics, Cognitive, Behavioural, Humanistic - Branches of psychology, Application of Psychology in Social Work.

### UNIT - II

**Evolution of human life:** Conception - Stages of Prenatal development a) Period of Ovum, b) Period of embryo, c) Period of Fetus - Birth and its types - Pre and Post natal care -

**Human growth and development:** Developmental tasks, Hazardous, Physical, Social, Emotional and Cognitive development of Infancy, Babyhood, Childhood, Puberty, Adolescence, Adult, Middle age, Old age (Applicable wherever relevant).

### UNIT - III

**Personality:** Definition and Characteristics - **Major approaches to personality:** Trait, Learning, Biological, Humanistic, Freudian and Neo Freudian - Assessment of personality - Influence of Heredity and Environment in one's personality development

**Intelligence:** Definition - **Theories of intelligence:** Unitary, Multi-factor, Two factor, Group factor, Hierarchical - Types of intelligence - Measurement of intelligence - Classification of I.Q - Mentally retarded - Gifted - **Motivation:** Definition, Human needs and motivation - Interaction of motivation - **Theories of motivation:** Instinct, Drive reduction, Arousal, Incentive, Cognitive, Maslow's Hierarchy.

### UNIT - IV

**Perception:** Definition, Characteristics, Perceptual processes, Factors influencing perception, Depth perception and Motion perception, Perceptual illusion, Subliminal perception and Extra sensory perception - **Learning:** Concept and **types of learning:** Cognitive, Sensory, Motion and Verbal learning - **Theories:** Trial and error, Classical conditioning, Operant conditioning, Insightful - Transfer of learning - **Attitude:** Definition, Nature, Components of attitude and their Consistency, Prejudice, Process of attitude change.

### UNIT - V

**Health Psychology:** Stress, Factors influencing stress, Stress reduction strategies (Coping, relaxation, Meditation, Group, Music, exercise and relationship therapies) - Defense mechanisms - A brief idea on major psychiatric illness - Significance of mental health - Role of social workers in promoting mental health.

### REFERENCE:

1. Feldman Robert. S. (2006). *Introduction to Psychology*. New Delhi: Tata Mc Graw Hill.
2. Mangal. S.K. (2007). *General Psychology*. New Delhi: Sterling.
3. Pankajam. G. (2005). *Know your Child*. New Delhi: Concept.
4. Pathak Shalini. (2007). *Human Development*. New Delh.,Sonali.
5. Sharma. K.K. (2003). *Principles of Developmental Psychology*. Jaipur: Sublime.



## Automotive Safety

Course code	20KUA4C07	Credits	04	Year	II
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	IV

### Objective:

- Identify several significant automobile safety devices and the technology involved.
- Illustrate how each device works and distinguish the purpose of those devices.
- An understanding of automotive safety, comfort systems & its future prospects.

### Course outcomes (CO):

CO1	Express the characteristics and importance of safety.	K2&K4
CO2	Understand and analyze the safety systems - ABS, air bags and seat belt, etc.,	K1 & K2
CO3	Analyze the comfort system requirements for automobiles.	K4
CO4	Describe the various systems that enhance vehicle safety, passenger comfort, and recent technologies in automobile.	K2 & K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	L	M		S	S	S	M	M
CO2	S	S	M	M	S		S	S	S	M	S
CO3	S	S	M	M	L		S	M	S	M	L
CO4	S	S	M	S	S		S	S	S	S	L

S – Strong; M – Medium; L – Low

### Unit I

**Introduction to automotive safety**, Design of the body for safety, engine location, deceleration of vehicle inside passenger compartment, deceleration on impact with stationary and movable obstacle, concept of crumple zone, safety sandwich construction

### Unit II

**Active safety**: driving safety, conditional safety, perceptibility safety, operating safety, passive safety: exterior safety, interior safety, deformation behavior of vehicle body, speed and acceleration characteristics of passenger compartment on impact.

### **Unit III**

Anti-lock braking system, air bags, electronic system for activating air bags, Seat belt regulations, automatic seat belt tightener system, collapsible steering column, tillable steering wheel, traction control systems, Roll over mitigation, , bumper design for safety

### **Unit IV**

Collision warning system, causes of rear end collision, adaptive cruise control, frontal object detection, rear vehicle object detection system, object detection system with braking system interactions, Reverse sensing system, Automatic emergency braking

### **Unit V**

Steering and mirror adjustment, central locking system, Automatic parking, Garage door opening system, tyre pressure control system, speed load limiting, rain sensor system, lighting and windscreen wipers control, environment information system, In-car internet.

### **Text Books:**

1. Bosch, "Automotive Handbook", 8th Edition, SAE publication, 2011.
2. "Fundamentals of Automotive and Engine Technology", Springer Nature; 2014

### **Reference Books:**

3. Powloski. J., "Vehicle Body Engineering", Business books limited, London, 1969.
4. Ronald.K.Jurgen, "Automotive Electronics Handbook", Second Edition, McGraw-Hill Inc., 1999.

## Open Elective II- TOTAL QUALITY MANAGEMENT

Course code	20KUG5EA2	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

### Objectives:

- To facilitate the understanding of **Quality Management principles and process.**

### Course Outcomes (CO)

<b>CO1</b>	Gain the knowledge of Quality management principles and Techniques.	<b>K1</b>
<b>CO2</b>	Understand the importance of the Quality and apply in industry.	<b>K2 &amp;K3</b>

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
<b>CO1</b>	L	M	L	S	S	L	M	M	S	S
<b>CO2</b>	L	M	L	S	S	L	M	M	S	S

S - Strong; M - Medium; L - Low

### Unit - I INTRODUCTION

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, and Customer retention - Costs of quality.

### Unit - II TQM PRINCIPLES

Leadership- Employee involvement - Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement - **PDSA cycle, 5s, Kaizen** - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

### Unit - III TQM TOOLS & TECHNIQUES I

The **seven traditional tools of quality** - New management tools - **Six-sigma**: Concepts, methodology, applications to manufacturing, service sector including IT

### Unit - IV TQM TOOLS & TECHNIQUES II

**Control Charts** - Process Capability - Quality Function Development (QFD) - Taguchi quality loss function - **TPM** - Concepts, improvement needs - Performance measures.

## **Unit - V    QUALITY SYSTEMS**

Need for **ISO 9000 - ISO 9001:2015, ISO 29990:2010** Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors.

### **TEXT BOOK**

1. Dale H.Besterfield, et al., "Total Quality Management", Pearson Education Asia, Third Edition, Indian Reprint (2006).
2. Janakiraman, B and Gopal, R.K, "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. L

### Open Elective II- BUSINESS ORGANIZATION

Course code	20KUG5EB2	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

#### Objectives:

- To understand the different types of business organizations.
- To understand the process of formation of business organization.

#### Course Outcomes (CO)

CO1	Understand the concept of business.	K2
CO2	Gain knowledge to start and run a business effectively in the modern society.	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	M	L	S	S	L	M	M	S	S
CO2	L	M	L	S	S	L	M	M	S	S

S - Strong; M - Medium; L - Low

#### Unit-I

**Business: Concept-** Objectives - Characteristics - Types and Qualities of a good Businessman.  
**Business Organization:** Concept- Characteristics of an ideal form of Business organization.

#### Unit-II

**Forms of Business Organisation** : Sole Trader, Partnership, Joint Stock Companies, Cooperative Organisation and Public Utilities - Merits and Demerits - Memorandum of Association and Articles of Association.

#### Unit-III

Company **Management-Shareholders:** Powers, Duties, Responsibilities and Functions- Composition of Board- Board of Directors: Functions -Chief Executive-Managing Director- Legal Restrictions-Provisions in the Companies Act.

#### Unit-IV

**Methods of raising funds:** Need and importance of ST & LT finance - Issue of Shares, issue of Debentures- Public deposits - assistance from Govt. and Industrial Financial Institutions borrowings from banks

**Unit-V**

Rationalisation: Definition- Objectives - Measures -Advantages-Automation- Business Combination: Concept- objectives - Causes - Types - Forms.

**Books Recommended:**

1. Y.K. Bhushan, Fundamentals of Business organization and Management, Sultan Chand & Sons, 2012.
2. N.Vinayagam, A Text Book of Business Organisation. Emerald Publications. 2011.
3. P.N.Reddy&S.S.Gulshan, Principles of Business Organization and Management, Eurasia Publishing House Pvt. Ltd., 2009.
4. KathiresanRatha, Business Organisation- Prasanna Publications. 2006.

### CORE VIII: ORGANIZATIONAL BEHAVIOUR

Course code	20KUA5C08	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	V

#### Objectives:

- To develop a sound theoretical knowledge and understanding of organizational behavior.
- To know how the people at work in an organization could be motivated to work together in harmony.
- To orient the student about leadership and perspective of organizational behavior.

#### Course Outcomes (CO)

CO1	Understand the values and importance to behave in an organization.	K2
CO2	Develop the skill of harmony to work together in the organization.	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M	L	M	L	S	S
CO2	L	L	L	S	M	L	M	L	S	S

S - Strong; M - Medium; L - Low

#### UNIT - I

**Organizational Behavior:** Concept, Historical background, Approaches and Models of OB - Challenges and Opportunities for OB -**Behavioral Science foundation:** Sociology, Psychology & Anthropology.

#### UNIT - II

**Individual Dimension of OB:** **Personality:** Self-esteem, Self-efficacy, perception, values - **Attitude:** Job satisfaction, job involvement, Organizational commitment - **Work Motivation:** Theories (Content, process) - **Job Design:** Job rotation, Job enlargement, Job enrichment- **Learning Theories:** Behaviorist, Cognitive and Social learning, Principles of learning - Punishment & Reinforcement.

#### UNIT - III

**Dynamics of OB:** Groups & Teams - Conflict & Negotiation - Stress & Stress management - **Leadership:** Types (Charismatic, Transformational and Substitute), Approaches (Managerial grid approaches, Likert's four system approaches), Skills - Emotional intelligence and managerial test.

#### UNIT - IV

**Perspective of OB:** Use and Types of Information Technology in Communication (MIS, Telecommunication, E-mail & Voice messaging) - **Non Verbal Communication:** Body Language & Paralanguage - **Decision making:** Group decision making, Delphi technique, Nominal group technique - Organizational Design - **Organizational culture and climate:** Definition and Characteristics.

#### UNIT - V

**Organizational Change and Development: Change:** Concept, Planned change, Resistance to change, Merges and Acquisitions - **Analysis:** Tools, techniques - **Development:** Concept, ESOP (Employee Stock Ownership Plan), Downsizing, Smart sizing.

#### Reference:

1. Amrik Singh Sudan & Kumar N. (2003). *Management Process and OB*. Delhi: Anmol Publications.
2. Don Hellriegel, John (etall). (1995). *Organizational Behaviour*. New York: West Publishing Company.
3. Jit S. Chandan. (1999). *Organisational Behaviour*. N. D: Vikas Publishing House.
4. Mishra M.N. (2001). *Organizational Behaviour*. Mumbai: vikas.



## Workshop Supervising and Management

Course code	20KUA5C09	Credits	05	Year	III
No. of Lecture Hours	75	No. of Practical Hours	--	Sem	V

### Objectives:

- Understand the roles and responsibilities of a supervisor (understanding the fundamentals of the supervision framework) to foster excellent performance that supports individual and organizational needs.
- Organize the service & repair department through, controlling manpower resources and other assets and tools at a level commensurate with workshop requirements.
- Understand and importance of motor vehicle and pollutions.

### Course outcomes (CO):

CO1	Gain knowledge about to Identifying, understanding and working with professional standards.	K2&K4
CO2	Manage quality issues in the work done by the technicians and components.	K1 & K2
CO3	Understanding of motor vehicle act.	K2
CO4	Identifying and understanding the various automotive components.	K2 & K4

K1 - Remember; K2 - Understand; K3 - Apply; K4 – Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5		PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M		S	S	S	M	M
CO2	S	S	M	S	M		S	S	S	S	M
CO3	S	S	M	M	S		S	M	M	M	S
CO4	S	S	M	M	M		S	S	S	M	L

S – Strong; M – Medium; L – Low

### Unit-I

**Basic principles of supervising** - Organising time and people - Job instruction training, training for new devices and techniques - Evaluate and allotment of technician - Vehicle operation and types of process - Work scheduling, Overtime, Breakdown analysis, Cost estimation - **Vehicle technical specifications of various OEM vehicular products** - Relevant and up-to-date knowledge of vehicle design, manufacture, consumer, industry and trade practices - Importance

of maintenance, types- preventive (scheduled) and breakdown (unscheduled) maintenance - Safety precautions in maintenance- Knowledge of free and paid service schedules, fault diagnosis, technician notes, job cards, warranty procedures, log sheets and other forms- Evaluate the information gathered from the customer report, customer satisfaction

## Unit-II

Lubrication system - lubricating/ engine oil top up, oil changing, cleaning methods, visual and dimensional inspections, minor/major adjustments of various components - maintenance of engine accessories- air filter, battery, cooling system, electrical wiring in engine compartment. Engine tune up, top overhauling, dismantling of engine - components, cleaning, visual and dimensional inspections, minor/major reconditioning of various components, reconditioning methods, engine assembly - special tools used for maintenance/ overhauling

## Unit-III

lubricating/ gear oil top up, oil changing, cleaning methods - visual and dimensional inspections, minor/major adjustments of various components of transmission system - Servicing and maintenance of clutch, gear box, propeller shaft, differential - Servicing and maintenance of suspension system, brake system, steering system, wheel alignment and wheel balancing

## Unit-IV

Checking of electrical components for functioning, checking of battery, electrolyte - top up, terminal cleaning & protection methods, checking of starter motor, checking of charging systems- fan belt tension checking and adjustment - Testing methods for checking of ignitions system, lighting system - fault diagnosis and maintenance of modern electronic controls - checking and servicing of dash board instruments.

## UNIT-V

**Motor Vehicle Act:** Schedules and sections, Registration of motor vehicles, Licensing of drivers, Control of permit, Limits of speed, traffic signs - Constructional regulations - Description of goods carrier, delivery van, tanker, tipper, Municipal - fire fighting and break down service vehicle.

**Pollution:** Pollutant formation in Engines, mechanism of HC and CO formation in four stroke and two stroke engines, NO<sub>x</sub> formation in engines - Engine Design modifications, fuel modification, evaporative emission control - EGR, air injection, thermal reactors, Water Injection, catalytic converters - Application of microprocessor in emission control- Pollution standards, driving cycles - Indian Pollution standards.

### Text book:

1. Ed May, "Automotive Mechanics Volume One" and Two , Mc Graw Hill Publications, 2003
2. Vehicle Service Manuals of reputed manufacturers

**Reference Book:**

1. Tim Gills, "Automotive Service: Inspection, Maintenance, Repairing", Cengage Learning, 2004.
2. Kirpal Singh, "Automobile Engineering", Vol 1 & 2, Seventh Edition, Standard Publishers, New Delhi, 1997.

### Open Elective III - PROFESSIONAL ETHICS AND HUMAN VALUES

Course code	20KUG6EA3	Credits	4	Year	III
No. of Lecture Hours	60	No. of Practical Hours	-	Sem	VI

#### Objectives:

- To understand what morality is and how it connects to professional ethics.
- To understand the features of moral reasoning, moral explanations and the role of moral theories.
- To develop a case resolution model for resolving moral dilemmas faced by professionals.

#### Course Outcomes (CO)

CO1	Create awareness of Ethics and moral values.	K1 &K2
CO2	Understand the importance of Ethics and code of conduct in business.	K2 &K3
CO3	Understand social responsibility in business and importance of human values	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M	L	L	L	S	S
CO2	L	L	L	S	M	L	L	L	S	S
CO3	L	L	L	S	M	L	L	L	S	S

S - Strong; M - Medium; L - Low

#### Unit I: Business Ethics

Conceptual approach - Emerging issues - Importance of Ethics - Understanding Ethics - Ethical decision making - Moral problem

#### Unit II: Managing Ethical Organization

Elements of ethical organization - Manager's role in influencing ethical climate - Codes of ethics - Codes of Contact - Ethical leadership - Ethical organization.

#### Unit III: Business ethics in Profession

Ethical concern in Human Resource Management (HRM) - Ethical issue in marketing and advertising - Marketing ethics - Ethics in production management - work ethics.

**Unit IV: Corporate Governance and social responsibility:**

Corporate Governance - Company management - Factors for success - Social responsibility towards stakeholders - Social responsibility of business.

**Unit V: Human Values**

Wisdom Management - A person of character - Knowledge Management - Understanding success - Stress management

**Text Book:**

1. Business Ethics and Global Values by S.K Bhatia, Deep & Deep Publication Pvt. Ltd., New Delhi

## SAFETY ENGINEERING

Course code	20KUA6C10	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

### Objectives:

- To follow standard safety rules and concepts.
- To understand the Safety procedures in material handling.
- To understand the Road and Electrical Safety.

### Course Outcomes (CO)

CO1	Understand the importance of safety.	K2
CO2	Able to handle the materials and tools safely.	K2 & K3
CO3	Follow the road and electrical safety.	K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	M	M	M	M	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S

S - Strong; M - Medium; L - Low

### Unit-I Introduction

Evolution of modern safety concept- Safety policy - Safety Organization - line and staff functions for safety- Safety Committee- budgeting for safety - Risk assessment & management - Safety Education and training- Importance, various training methods - First Aid, Resuscitation, Bleeding, management of shock, Burns, scalds and accidents caused by electricity, Rescue and transport of casualty Role of management and role of Govt. in industrial safety, safety analysis.

### Unit-II Safety prevention

Definitions and theories, Accident, Injury, unsafe condition, Dangerous occurrence- Cost of accidents- Accident prevention- Safety performance - Personal protective equipment- survey the plant for locations and hazards, part of body to be protected - Economic importance of accidents, Analysis of accident records, accident investigations.

### **Unit-III Safety in Material Handling**

General safety rules, principles, maintenance, Inspections of turning machines, boring machines, milling machine, planning machine and grinding machines, CNC machines, electrical guards, work area, material handling, inspection - Heat treatment operations, paint shops, sand and shot blasting, safety in inspection and testing, pressure vessels, air leak test, steam testing, safety in radiography, personal monitoring devices, radiation hazards.

### **Unit-IV Shop floor Safety**

Automotive vehicle design, selection, operation and maintenance of motor vehicle - Basic automotive road Signals, Symbols, Rules and Regulation - safety on manual, mechanical handling equipment operations - Servicing and maintenance equipment grease rack operation wash rack operation - battery charging - gasoline handling - other safe practices - preventive maintenance - check lists - motor vehicle insurance and surveys.

### **Unit-V Electrical Safety**

General principles of electric safety - Preventive maintenance - Electricity & Human body - Earthing / Grounding - Safety against over voltage, extra-low and residual voltages - Hazardous areas, Electrical insulation - Energy leakage - Electrical fires and Arc flash - Electrical causes of fire and explosion - National electrical Safety code - Safety in the use of portable tools.

#### **Text Books:**

1. C.RayAsfahl ,*Industrial Safety and Health management*, Pearson Prentice Hall,2003.  
N.V Krishnan. *Safety Management in Industry* Jaico Publishing House, Bombay, 1997.

## Open Elective IV - ENTREPRENEURSHIP DEVELOPMENT

Course code	20KUG6EA4	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

### Objectives:

- To understand the concept of Entrepreneur and entrepreneurship.
- To gain the knowledge about financial institutions.
- To understand the institutional setup, incentives and subsidies.
- To evaluate business ideas and to prepare the project report.

### Course Outcomes (CO)

CO1	Understand concept of finance institutions, project report, incentives and subsidies.	K2
CO2	Develop the qualities to become an entrepreneur	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	M	M	L	S	M	L	M	M	S	S
CO2	M	M	M	S	M	L	M	M	S	S

S - Strong; M - Medium; L - Low

### Unit I: Entrepreneurship

Meaning, Definition, Characteristics and Functions-Role of Entrepreneur in economic development -Types-Qualities of an Entrepreneurs - Classification of Entrepreneurs-Factors Influencing Entrepreneurship - Entrepreneurship development programme - Self Employment schemes - Government policies on Entrepreneurial development.

### Unit II: Institutional Finance to Entrepreneurs

State Level Financial Institutions: State Financial Corporation (SFCS) - State Industrial Development Corporation (SIDCS) - Tamilnadu Industrial Investment Corporation (TIIC) - Small Industries Promotion Corporation of Tamilnadu (SIPCOT).

### All Indian Financial Institutions:

Industrial Development Bank of India (IDBI) - Industrial Finance Corporation of India (IFCI) - Industrial Credit Investment Corporation of India (ICICI) - Industrial Rural Development Bank of India (IRDBI).



**Unit III: Institutional Setup to Entrepreneurs**

District Industries Centre (DIC) - National Small Industries Corporation (NSIC) - Small Industries Development Corporation (SIDC) - Small Industries Service Institute (SISI) - Indian Investment Centre - Kadhi and Village Industries (KVIC).

**Unit IV: Incentives and Subsidies of State and Central Government**

Subsidy For Market - Capital Assistance - Subsidized Services - Taxations, Benefits to SSI - Transport Subsidy - Seed Capital Assistance - Special Facilities for imports.

**Unit V: Sources of Ideas**

Preliminary Evaluation and Testing of ideas - Demand based industries and Resource based industries - **Project Formulation** - Project Identification-Evaluation-Feasibility Analysis-Project Report.

**Text Books:**

1. Radha V, Entrepreneurship Development, Prasanna Publication House, 2008.
2. KhakaSS, Entrepreneurship Development, S. Chand & Co. Ltd. 2010.
3. Vasant Desai. The Dynamics of Entrepreneurship Development and Management.
4. Gupta C. B, Srinivasan N.P. Entrepreneurship Development, S. Chand & Co. Ltd. 2011.

### Open Elective IV -HUMAN RESOURCE MANAGEMENT

Course code	20KUG6EB4	Credits	04	Year	III
No. of Lecture Hours	60	No. of Practical Hours	--	Sem	VI

#### Objectives:

- To achieve a sound theoretical understanding about Human Resource Management.
- To develop knowledge and skill in handling Human Resource in an organization.
- To orient the student about the social compliance & Social Audit followed by an organization.
- To acquaint the student with the goals of the organization

#### Course Outcomes (CO)

CO1	Basic understanding and gain knowledge about the role and responsibilities of HR Manager.	K2
CO2	Develop the problem solving attitude.	K2 &K3
CO3	Develop the qualities to become an HR manager.	K2 &K3

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	L	L	L	S	M	L	M	M	S	S
CO2	L	L	M	S	M	L	S	M	S	S
CO3	L	L	M	S	M	L	S	M	S	S

S - Strong; M - Medium; L - Low

#### UNIT - I: Introduction to Human Resource Management:

**Human Resource Management:** Definition, Objectives, Importance and Functions (An overview of Operative and Managerial) - **HRM Models:** Rational model, Social system model, Human resource development model - **Human Resource Policies:** Meaning, importance, types and formulation - Role of human resource manager.

#### UNIT - II: Acquiring Human Resources:

**Human Resource Planning:** Definition, Need, Process - **Job analysis:** Job Description, Job specification - **Recruitment:** Meaning, Sources of Recruitment (internal and external) - e recruitment - Recent trends in Recruitment - **Selection:** Meaning and Steps - Placement and Induction.

### **UNIT - III: Developing Human Resources:**

**Employee Training:** Meaning, Objectives, Importance, Types, Methods, Needs for Training and Evaluation of Training effectiveness - **Human Resource Development:** Concept, Need, Interventions - **Performance Appraisal:** Objectives, Uses and **Methods:** Traditional and Modern methods (720 Degree performance appraisal system), Barriers of performance appraisal - Career planning, Succession planning and Competency map.

### **UNIT - IV: Compensation, Retaining and Controlling of Human Resource:**

**Wage and Salary Administration:** Concept and Methods of Wages - Theories - Incentives - Job evaluation - Employee Benefits and Services. **Retaining of Human Resource:** Promotion: Meaning, purpose, types - Demotion - Transfer - Separation. **Controlling of Human Resource:** Human Resource Records: Meaning, objectives, importance, types and Principles of Record Keeping - Human Resource Reports - Human Resource Audit : Meaning, objectives, importance and scope - Human Resource Research: Meaning, objectives and techniques.

### **UNIT - V: Strategy of quality management:**

**Social Compliance:** Definition, Meaning and Significance - **Social Compliance Audit:** Purpose, Obligations of employers, Audit process - **Social Compliance Standard:** SA 8000 (Social Accountability 8000) - **Social Compliance Training:** GSCP (Global Social Compliance Programme) - **Social Compliance Certification:** Principles, Significance of WRAP (Worldwide Responsible Accredited Production).

**Strategy of quality management:** Six Sigma, Keizen, TQM, TPM, QMS - ISO Systems, ISO Certification Schemes, **ISO types:** ISO 9001, 14001, ISO/TS 16949- **Preparing an Organization for ISO Certification** - **Quality assurance:** Mckinesey's 7s frame work, HR out sourcing - People Capacity Maturity Model (PCMM).

### **REFERENCE**

1. Ahuja. (2002). *Personnel Management*. Luthian: Kalyani Publishing.
2. BiswajeetPattanayak. (2001). *Human Resource Management*. New Delhi: Prentice Hall of India Private Ltd.
3. Decenzo and Robbins. (2001). *Personnel/Human Resource Management*. New Delhi: Prentice Hall.
4. Jayagopal R. (1992). *HRD Conceptual Analysis and Strategies*. New Delhi: Sterling.
5. Lynton and Pareek. (1990). *Training for Development*. New Delhi: Vistar.