SCHEME OF TEACHING AND EXAMINATION

B.E. VI SEMESTER- AUTOMOBILE ENGINEERING

S. No.	Board of Study	Sub. Code	SUBJECT	PERIODS PER WEEK			SCHEME OF EXAM Theory/Practical			Total Marks	Credit L+(T+P/2
				L	T	P	ESE	CT	TA		
1.	Mech. Engg	382651(37)	Vehicle Maintenance	4	1	-	80	20	20	120	5
2.	Mech. Engg	382652(37)	Vehicle Design	4	1	-	80	20	20	120	5
3.	Mech. Engg	382653(37)	Automotive Engine Component Design	4	1	-	80	20	20	120	5
4	Mech. Engg	337654 (37)	Heat & Mass Transfer	4	1	-	80	20	20	120	5
5	Mech. Engg	337655 (37)	Production Management	3	1	-	80	20	20	120	4
6	**Refer Table**		**Professional Elective-I**	4	1	-	80	20	20	120	5
7	Mech. Engg	382661(37)	Vehicle Maintenance Lab	-	-	2	40	-	20	60	1
8	Mech. Engg	382662(37)	Automotive Engine Chassis Components Lab	-	-	2	40	-	20	60	1
9	Mech. Engg	382663 (37)	Production Management Lab	-	-	2	40	-	20	60	1
10	Mech. Engg	382664 (37)	HMT Lab	-	-	2	40	-	20	60	1
11	Management	382665(76)	Management Skills	-	-	2	40	-	40	40	1
12			Library	-	-	1	-	-	-	-	-
			Total	23	6	11	640	120	240	1000	34

L – Lecturer T – Tutorial,
P – Practical, ESE – End Semester Exam, CT – Class Test
TA – Teacher's Assessment

Note: Industrial Training of twelve weeks is mandatory for B.E. students. It is to be completed in two equal parts. The first part most have been completed in summer after 4th sem. The 2nd part to be completed to be during summer after six sem. After which students have to submit a training report which will be evaluated by college teachers during BE-VII sem.

Table – 1
Professional Elective - I

S.No.	Branch	Subject Code	Subject
1	Automobile	382671(82)	Engine Auxillary Systems
2	Automobile	382672(82)	Vehicle Transport Management
3	Automobile	382673(82)	New Generation And Hybrid Vehicles
4	Automobile	382674(82)	Supercharging And Scavenging
5	Automobile	382675(82)	Automotive Aerodynamics
6	Automobile	382676(82)	Maintenance and Reliability

Note: (1) 1/4th of total strength of students subject to minimum of 20 students is required to offer and elective in the college in a particular academic session.

Note: (2) Choice of elective course once made for an examination cannot be changed in future examinations.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Vehicle Maintenance **Code: 382651(37)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

COURSE OBJECTIVE :
At the end of the course, the students will be able to have a complete knowledge of the vehicle maintenance procedures and acquire skills in handling situations where the vehicle is likely to fail.

UNIT- I

MAINTENANCE OF RECORDS AND SCHEDULES
Requirements and importance of maintenance, types of maintenance, preparation of check lists, Inspection schedule, maintenance of records, log sheets and other forms, safety precautions in maintenance. Motor vehicle acts, insurance etc and traffic rules, motor vehicle driving rules and regulation.

UNIT- II

ENGINE MAINTENANCE – REPAIR AND OVERHAULING
Dismantling of engine components and cleaning, cleaning methods, visual and dimensional inspections, minor and major reconditioning of various components, reconditioning methods, engine assembly, special tools used for maintenance overhauling, engine tune up, including modern engines.

UNIT-III

CHASSIS MAINTENANCE - REPAIR AND OVERHAULING
Mechanical and automobile clutch, fluid flywheel, torque converter, automatic transmission and gear box, servicing and maintenance. Maintenance servicing of propeller shaft and differential system. Maintenance servicing of suspension systems. Brake systems, types and servicing techniques. Steering systems, overhauling and maintenance. Wheel alignment, computerized alignment and wheel balancing.

UNIT- IV

ELECTRICAL AND ELECTRONIC SYSTEM MAINTENANCE - SERVICING AND REPAIRS
Testing methods for checking electrical and electronic components, checking battery, starter motor, charging systems, DC generator and alternator, ignitions system, lighting systems. Fault diagnosis and maintenance of modern electronic controls, checking and servicing of dash board instruments.

UNIT-V

MAINTENANCE OF FUEL SYSTEM, COOLING SYSTEMS, LUBRICATION SYSTEM AND VECHICLE BODY
Servicing and maintenance of fuel system of different types of vehicles, calibration and tuning of engine for optimum fuel supply. Cooling systems, water pump, radiator, thermostat, anticorrosion and anti-freeze additives. Lubrication maintenance, lubricating oil changing, greasing of parts. Vehicle body maintenance, minor and major repairs. Door locks and window glass actuating system maintenance.

TEXT BOOKS
1. Fleet Management -John Doke, McGraw-Hill Co. 1984.
2.Automotive Mechanics- W.H. crouse

REFERENCES
1. Advanced Engine Performance Diagnosis–James D Halderman - PHI 1998.
2. Service Manuals from Different Vehicle Manufacturers.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Vehicle Design **Code: 382652(37)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

UNIT- I

VEHICLE FRAME AND SUSPENSION
Study of loads- moments and stresses on frame members, Design of frame for passenger and commercial vehicle-design of leaf springs-Coil springs and torsion bar springs

UNIT- II

FRONT AXLE AND STEERING SYSTEMS
Analysis of loads- moments and stresses at different sections of front axle. Determination of bearing loads at kingpin bearings. Wheel spindle bearings. Choice of bearings. Determination of optimum dimensions and proportions for steering linkages ensuring minimum error in steering. Design of front axle beam.

UNIT- III

CLUTCH
Torque capacity of single plate, multi plate and cone clutch. Design of clutch components, design details of roller and spray type of clutches.

UNIT- IV

GEAR BOX
Gear train calculations, layout of gear box constant mesh and synchronous mesh gear box. Design of three speeds and four speed gear boxes.

UNIT- V

DRIVE LINE AND REAR AXLE
Design of propeller shaft and types of propeller shaft. Design details of final drives gearing. Design details of full floating. Semi-floating and three quarter floating rear shafts and rear axle housings. Design aspects of final drive.

Text Books

1. Automotive chassis- Heldt,P.M-Chilton Book Co., 1992
2. Torque Converters- Heldt,P.M-Chilton Book Co., 1992

References

1. Automobile Chassis Design- Dean Averns—Life Book Co.,1982
2. Automobile Mechanics- Giri.N.K-Khanna Publishers,NewDelhi,1998
3. The automotive Chassis Engineering Principles—SAE-Sept.,1995

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Automotive Engine Component Design **Code: 382653(37)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

OBJECTIVE
To make the students understand the design concept and principles of various engine components. These concepts and principles are familiarized for design of components.

UNIT I

INTRODUCTION
Engineering materials - Introduction endurance limit, notch sensitivity. Tolerances, types of tolerances and fits, design considerations for interference fits, surface finish, surface roughness, Rankine's formula - Tetmajer's formula - Johnson formula- design of push- rods.

UNIT II

DESIGN OF CYLINDER, PISTON AND CONNECTING ROD
Choice of material for cylinder and piston, design of cylinder, piston, piston pin, piston rings, piston failures, lubrication of piston assembly. Material for connecting rod, determining minimum length of connecting rod, small end design, shank design, design of big end cap bolts.

UNIT III

DESIGN OF CRANKSHAFT
Balancing of I.C. engines, significance of firing order. Material for crankshaft, design of crankshaft under bending and twisting, balancing weight calculations, development of short and long crank arms. Front and rear-end details.

UNIT IV

DESIGN OF FLYWHEELS
Determination of the mass of a flywheel for a given co- efficient of speed fluctuation. Engine flywheel - stresses on the rim of the flywheels. Design of hubs and arms of the flywheel, turning moment diagram.

UNIT V

DESIGN OF VALVES AND VALVE TRAIN
Design aspects of intake & exhaust manifolds, inlet & exhaust valves, valve springs, tappets and valve train. Design of cam & camshaft. Design of rocker arm. Cam profile generation

TEXT BOOK:

1. A textbook of Machine Design- Khurmi.R.S.& Gupta. J.K.Eurasia Publishing House (Pvt) Ltd, 2001.

REFERENCES:

1. Machine Design -Jain.R.K, Khanna Publishers, New Delhi, 2005.
2. Automobile Mechanics -Giri.N.K, Khanna Publishers, New Delhi, 2007

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Heat & Mass Transfer **Code: 337654 (37)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

Course Objectives

To provide a fundamental understanding of the principles of heat transfer due to conduction, convection and radiation.
To achieve an understanding of the basic concepts of phase change processes.
To understand the principles of mass transfer.
To learn about the design of heat exchangers

UNIT I Introduction: Heat transfer, Difference between heat transfer and thermodynamics, Various modes of heat transfer,Fourier's, Newton's and Stefan Boltzman's Law, Combined modes of heat transfer, thermal diffusivity, overall heat transfer coefficient. The thermal conductivity of solids, liquids and gases, factors influencing conductivity
Conduction : Heat conduction without heat generation: Derivation of general differential equation of heat conduction in Cartesian co-ordinate. One dimensional steady state conduction, linear heat flow through a plane and composite wall, heat conduction without heat generation in cylinder and sphere, critical thickness of insulation. Conduction with heat generation in flat wall and solid cylinder.

UNIT II **Heat transfer from extended surface (Fins):** Types of fins, Fin equation for uniform cross sectional area (rectangular profile), Solution for infinite length, negligible heat loss from fin tip, finite long and heat transfer from fin tip. Fin effectiveness and efficiency. Error in temperature measurement from thermometer.
Transient/Unsteady State Heat Conduction: Lumped system analysis, criteria for lumped system analysis, solution of transient heat conduction in large plane wall, long cylinders and sphere through Heisler`s chart.

UNIT III **Forced Convection**: Physical Mechanism of Forced Convection, Dimensional analysis for forced convection, velocity and Thermal Boundary layer, Flow over plates, Flow across cylinders and spheres, Flow in tubes, Reynold's analogy.
Natural Convection: Physical Mechanism of Natural Convection, Dimensional analysis of natural convection; empirical relationship for natural convection.

UNIT IV **Two Phase Heat Transfer**: Boiling heat transfer, Pool boiling, boiling regimes and boiling curve, heat transfer correlations in pool boiling. Condensation heat transfer, Film condensation, derivation for the average heat transfer coefficient 'h' for the case of laminar film condensation over vertical plate, Heat transfer correlation for inclined plates, vertical tubes, Horizontal bank tubes.
Introduction to Mass Transfer : Mass and mole concentrations, molecular diffusion, eddy diffusion, Molecular diffusion from an evaporating fluid surface, Introduction to mass transfer in laminar and turbulent convection Combined heat and mass transfer, the wet and dry bulb thermometer.

UNIT V **Heat Exchangers:** Different types of heat exchangers; Determination of heat exchanger performance, Heat exchanger transfer units, Analysis restricted to parallel and counter flow heat exchanger (LMTD and NTU method)
Thermal Radiation: Introduction, absorbtivity, reflectivity & transmissivity. Concept of black body & grey body. Emissive power of surface, Kirchoff's law, emissivity , Concept of shape factor. Radiat heat exchange between two parallel grey surface and concentric cylinders. Errors in temperature measurement due to radiation. Concept of irradiation and radiosity.

TEXT BOOKS:

1. Heat Transfer – S.P. Sukhatme – TMH,Delhi
2. Heat & Mass Transfer – D.S. Kumar – S.K. Kataria & Sons,Delhi

REFERENCE BOOKS:

1. Heat transfer- C P Arora, TMH,Delhi
2. Heat & Mass Transfer – R, Yadav, Central Publishing House, Allahabad
3. Heat & Mass Transfer – R.K. Rajput, S.Chand, Delhi
4. Heat & Mass Transfer – P.K. Nag, TMH, Delhi
5. Heat Transfer – J.P. Holman – TMH, Delhi
6. Heat Transfer – A Practical Approach – Yunus A. Cengel – McGraw Hill ,Delhi
7. Heat Transfer – P.S. Ghoshdastidhar – Oxford University Press
8. Heat And Mass Transfer Fundamentals And Applications- Cengel, Yunus, A and AJ Ghajar, TMH, Delhi
9. A Course In Heat And Mass Transfer- S.C. Arora & S Donkundwar, S- Dhanpat Rai,Delhi
10. Heat and Mass Transfer Data Book- C.P.Kothandaraman C.P. & S. Subramanyan , New Age, Delhi

Course Outcome:

Apply knowledge of heat transfer for understanding, formulating and solving engineering problems.
Acquire knowledge and hands-on competence in applying the concepts of heat and mass transfer in the design and development of mechanical systems.
Demonstrate creativeness in designing new systems components and processes in the field of engineering in general and mechanical engineering in particular
Identify, analysis, and solve mechanical engineering problems useful to the society.
Work effectively with engineering and science teams as well as with multidisciplinary designs.

Note: *(Use of P S G Design Data Book is permitted in the University examination)*

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Production Management **Code: 337655 (37)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests: Two (Minimum) **Assignments: Two (Minimum)**
ESE Duration: Three Hours **Maximum Marks: 80** **Minimum Marks: 28**

COURSE OBJECTIVES:
1. To understand the basic concept of production management.
2. To understand the concept of breakeven analysis.
3. To learn the different methods to solve problems in sales forecasting.
4. To understand the concept of planning, organizing & controlling.
5. To understand the various models of inventory control.
6. To understand the methods of purchasing & store keeping.

UNIT I

Production Management

Definition, objectives, scope, benefits, functions of production management, place of production management in an organization, types of production system, Product life cycle, product design and development, production cycle.

Costing and Cost Analysis

Elements of costs, Break even analysis, Incremental costs, make or buy decision.

UNIT II

Sales Forecasting

Purposes, methods – Delphi, linear regression, economic indicators, time-series analysis, adjustment for seasonal variations, moving average, exponential smoothing.

UNIT III

Production Planning and Control

Functions, Organization, Master Scheduling, Aggregate planning and strategies ,Materials requirement planning, product structure tree, Routing, Loading Scheduling – forward and backward, Dispatching – priority rules, Sequencing, Johnson's algorithm for n jobs and two machines, Gantt's chart, Bar chart, Flow process chart.

Materials Handling

Principles of materials handling, unit load, Types of materials handling equipment, Relation between materials handling and plant layout.

UNIT IV

Material Management-

Objectives and functions of materials management, Organization of materials management.

Procurement

Objectives of purchase deptt. Purchase responsibilities and organization, types of purchasing, purchase procedures, Import and Export.

Stores Keeping

Stores m a n a g e m e n t , functions of stores, classification of materials, standardization of materials, identification and maintenance of layout of stores, physical control of materials, pricing of stores, issuing of stores.

Inventory Control

Objective, scope and functions of inventory control, inventory control techniques, economic ordering quantity, periodic ordering quantity, A.B.C. analysis, General idea regarding inventory control under risk and uncertainty.

UNIT V

Quality Control

Difference between inspection and quality control, acceptance sampling, procedure's risk and consumer's risk, operating characteristic curve for single sampling plan, AOQL

Quality of conformance, quality of design, economics of quality, SQC charts for variables and attributes.

TEXT BOOKS

1. Production and operation Management – By P. Ramamurty – New Age International Pub., 2005
2. Production and operation Management – By R. Mayer – TMH
3. Quality Planning and Analysis, Juran and Gryna

REFERENCE BOOKS

1. Industrial Engineering & Production Management – Martand Telsang – S. Chand & Co., 2004
2. Production and operations Management by – Adam and Ebert – PHI – 6th Edn., 2003

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Vehicle Maintenance Lab **Code: 382661(37)**
Total Lab Periods: 24 **Batch Size: 30**
Maximum Marks: 40 **Minimum Marks: 20**

1. Study and layout of an automobile repair, service and maintenance shop.
2. Study and preparation of different statements/records required for the repair and Maintenance works.
3. Cylinder re-boring – checking the cylinder bore, Setting the tool and re-boring.
4. Calibration of fuel injection pump
5. Minor and major tune up of gasoline and diesel engines.
6. Study and checking of wheel alignment - testing of camber, caster.
7. Testing kingpin inclination, toe-in and toe-out
8. Brake adjustment and Brake bleeding.
9. Simple tinkering, soldering works of body panels, study of door lock and window glass rising mechanisms.
10. Battery testing and maintenance.

Practice the following:

I. Adjustment of pedal play in clutch, brake, hand brake lever and steering wheel play
II. Air bleeding from hydraulic brakes, air bleeding of diesel fuel system
III. Wheel bearings tightening and adjustment
IV. Adjustment of head lights beam
V. Removal and fitting of tyre and tube

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Automotive Engine & Chassis Components Lab **Code: 382662(37)**
Total Lab Periods: 24 **Batch Size: 30**
Maximum Marks: 40 **Minimum Marks: 20**

LIST OF EXPERIMENTS

1. Study of Frames used for

   HMV, LMV, Car and Two Wheelers.

2. Dismantling and assembling of different types of engines

3. Dismantling and assembling of

4. Dismantling and assembling of Fuel Supply System

5. Dismantling and assembling of Steering System,

6. Dismantling and assembling Suspension System,

7. Dismantling and assembling of Braking System,

8. Dismantling and assembling of Wheels and Tyres

9. Dismantling and assembling of Propeller Shaft, Universal Joints and Differential

10. Study of Driver Seat

11. Brake adjustment and bleeding

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Heat and Mass Transfer Lab **Code: 382664 (37)**
Total Lab Periods: 24 **Batch Size: 30**
Maximum Marks: 40 **Minimum Marks: 20**

List of Experiments (At least Ten experiments are to performed by each student):

1. To Determine Thermal Conductivity of Insulating Powders.
2. To Determine Thermal Conductivity of a Good Conductor of Heat (Metal Rod).
3. To Measure the thermal Conductivity of Liquid.
4. To determine the transfer Rate & Temperature Distribution for a Pin Fin.
5. To Measure the Emmissivity of the Test plate Surface.
6. To Determine Stefan Boltzman Constant of Radiation Heat Transfer.
7. To Determine the Surface Heat Transfer Coefficient For Heated Vertical Cylinder in Natural Convection.
8. Determination of Heat Transfer Coefficient in Drop Wise & Film Wise condensation.
9. To Determine Critical Heat Flux in Saturated Pool Boiling.
10. To Study Performance of Simple Heat Pipes.
11. To Study and Compare LMTD and Effectiveness in Parallel and Counter Flow Heat Exchangers.
12. To Find the Heat transfer Coefficient in Forced Convection in a tube.
13. To determine the total thermal conductivity and thermal resistance of the given compound resistance in series.
14. To find out the thermal conductivity of given slab material.
15. To determine the individual thermal conductivity of different lagging in a lagged pipe.
16. To study the rates of heat transfer for different materials and geometries
17. To understand the importance and validity of engineering assumptions through the lumped heat capacity method.
18. Testing and performance of different heat insulators.

List of Equipments/Machines required:

1. Thermal conductivity of insulating powder apparatus
2. Thermal conductivity of metal bar apparatus
3. Thermal conductivity of liquid apparatus
4. Transfer rate and temperature distribution for a pin fin apparatus
5. Emmissivity of the test plate surface apparatus
6. Stefen-Boltzman constant of radiation of heat transfer apparatus
7. Surface heat transfer coefficient for heated vertical cylinder in natural convection apparatus
8. Heat transfer coefficient in drop wise and film wise condensation apparatus
9. Critical heat flux in saturated pool boiling apparatus
10. Performance of different heat pipe apparatus
11. Heat transfer rate through heat exchanger apparatus
12. Heat transfer coefficient in forced convection of air in a tube apparatus
13. Heat transfer through composite wall apparatus
14. Thermal conductivity of insulating slab apparatus
15. Heat transfer through lagged pipe apparatus
16. Unsteady state heat transfer apparatus
17. Testing and performance test rig for heat insulators.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Production Management Lab **Code: 382663 (37)**
Total Lab Periods: 24 **Batch Size: 30**
Maximum Marks: 40 **Minimum Marks: 20**

The lab work is intended to have exposure and enhance the knowledge of students in production/ operation Management field acquired in the theory class. The basic approach followed is an information decision – making Approach using various cases / small projects. These cases / projects deal with the kind of information that is present in the real world of the system and can also be solved using simulation based software. Simulation software provides Excellent ease of learning and to rapidly achieve a high degree of self-sufficiency in model building.
Considering any one manufacturing product, the following practical problems are to be solved by the students for the Production Management laboratory.

1. Case study on Sales Forecasting.
2. Product Development process including its major operations, production process etc of a simple product.
3. Study of the Organization and their process layout.
4. Material Requirement Planning of any industrial product.
5. Study of Material handling systems in any manufacturing organization.
6. Analysis of Inventory control in an organization.
7. Production cost study with Break Even Analysis in a manufacturing organization.
8. Quality Analysis of a product carried out in a manufacturing organization.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semester: VI**
Subject: Managerial Skill **Code: 382665(76)**
No Periods: 2 per week **Total Tutorial periods:Nil**
Maximum Marks: 40 **Minimum Marks: 24**

UNIT-I

Managerial Communication Skills: Importance of Business Writing: writing business letters, memorandum, minutes, and reports- informal and formal, legal aspects of business communication, oral communication-presentation, conversation skills, negotiations, and listening skills, how to structure speech and presentation, body language.

UNIT- II

Managerial skills: Leadership: Characteristics of leader, how to develop leadership; ethics and values of leadership, leaders who make difference, conduct of meetings, small group communications and Brain storming, Decision making, How to make right decision, Conflicts and cooperation, Dissatisfaction: Making them productive

UNIT-III

Proactive Manager: How to become the real you: The journey of self-discovery, the path of self- discovery, Assertiveness: A skill to develop, Hero or developer, Difference between manager and leader, Managerial skill check list, team development, How to teach and train, time management, Stress management, Self assessment

UNIT-IV

Attitudinal Change: Meaning of attitude through example, benefits of positive attitude, how to develop habit of positive thinking, what is fear? How to win it? How to win over failure? How to overcome criticism? How to become real you? How to Motivate?

UNIT-V

Creativity – a managerial skill, Trying to get a grip on creativity.
Overview of Management Concepts: Function of Management: Planning, organizing, staffing, controlling

Text & Reference Books:

1.Basic Managerial skills for all by E.H. McGrawth, Prentice Hall India Pvt Ltd,2006
2.How to develop a pleasing personality by Atul John Rego, Better yourself bools, Mumbai,
3.The powerful Personality by Dr. Ujjawal Patni & Dr. Pratap Deshmukh, Fusion Books, 2006
4.How to Success by Brian Adams, Better Yourself books, Mumbai, 1969

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: Engine Auxiliary Systems **Code: 382671(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

UNIT I

CARBURETION
Properties of air-petrol mixtures, Mixture requirements for steady state and transient operation, Mixture formation studies of volatile fuels, design of elementary carburetor, Chokes, Effects of altitude on carburetion, Carburetor for 2-stroke and 4-stroke engines, carburetor systems for emission control.

UNIT II

GASOLINE INJECTION AND IGNITION SYSTEMS
Petrol Injection, Pneumatic and Electronic Fuel Injection Systems types. Ignition system requirements, Timing, Ignition Systems, breaker mechanism and spark plugs, Factors affecting energy requirement of the ignition system, factors affecting spark plug operation, Electronic Ignition Systems.

UNIT III

DIESEL FUEL INJECTION
Factors influencing fuel spray atomization, penetration and dispersion of diesel and heavy oils and their properties, rate and duration of injection, fuel line hydraulics, fuel pump, injectors, CRDI systems and its merits and demerits.

UNIT IV

MANIFOLDS AND MIXTURE DISTRIBUTION
Intake system components, Discharge coefficient, Pressure drop, Air filter, Intake manifold, Connecting pipe, Exhaust system components, Exhaust manifold and exhaust pipe, Spark arresters, Waste heat recovery, Exhaust mufflers, Type of mufflers, exhaust manifold expansion.

UNIT V

LUBRICATION AND COOLING SYSTEMS
Lubricants, lubricating systems, Lubrication of piston rings, bearings, oil consumption, Oil cooling. Heat transfer coefficients, liquid and air cooled engines, coolants, additives and lubricity improvers, concept of adiabatic engines.

TEXT BOOKS:

1. Ramalingam,K.K, Internal Combustion Engine, Scitech Publication (India)

2. Ganesan, V., Internal Combustion Engines, Tata McGraw-Hill Book Co., 1995.

REFERENCES

1. Domkundwar, V.M, A Course in Internal Combustion Engines, Dhanpat Rai and Co.,1999.

2. Mathur,M.L., and Sharma,R.P., A Course in Internal Combustion Engines, Dhanpat Rai Publications (P) Ltd., 1998.

3. Duffy Smith, Auto Fuel Sytstems, The Good Heart Willcox Company Inc., Publishers,1987.

4. Edward F, Obert, Internal Combustion Engines and Air Pollution, Intext Education Publishers, 1980.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: Vehicle Transport Management **Code: 382672(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

COURSE OBJECTIVES

At the end of the course, students will be able to know

- Vehicle maintenance
- Organization and management.
- Budgeting, supply management.
- Scheduling and fare structure.
- Motor vehicle act

UNIT - I

ORGANISATION AND MANAGEMENT

Forms of Ownership – principle of Transport Management-Staff administration –Recruitment and Training – welfare health and safety. Basic principles of supervising. Organizing time and people. Driver and mechanic hiring - Driver checklist - Lists for driver and mechanic - Trip leasing - Vehicle operation and types of operations.

UNIT - II

VEHICLE MAINTENACE

Scheduled and unscheduled maintenance - Planning and scope - Evaluation of PMI programme – Work scheduling - Overtime - Breakdown analysis - Control of repair backlogs - Cost of options.

UNIT - III

VEHICLE PARTS, SUPPLY MANAGEMENT AND BUDGET

Cost of inventory - Balancing inventory cost against downtime - Parts control - Bin tag systems – Time management - Time record keeping - Budget activity - Capital expenditures - Classification of vehicle expenses - Fleet management and data processing - Data processing systems - Software. Model - Computer controlling of fleet activity - Energy management.

UNIT – IV

SCHEDULING AND FARE STRUCTURE

Route planning - Scheduling of transport vehicles - Preparation of timetable – preparation of vehicle and crew schedule - Costs, fare structure – Fare concessions - Methods of fare collection - Preparation of fare table.

UNIT - V

MOTOR VEHICLE ACT

Schedules and sections - Registration of motor vehicles - Licensing of drivers and conductors - Control of permits - Limits of speed - traffic signs - Constructional regulations - Description of goods carrier, delivery van, tanker, tipper, municipal, fire fighting and break down service vehicle.

TEXT BOOK

1.John Dolu, *Fleet Management*, McGraw-Hill Co., 1984

REFERENCE BOOKS

1. Goverment Publication, *The Motor vehicle Act*, 1989.
2. Rex W Faulks, *Bus and Coach Operation*, Butterworth, 1987.
3. Kitchin.L.D., *Bus operation*, 3rd Edition, llliffe and Sons Ltd., London, 1992.
4. Kadiyali.L.R., *Traffic engineering and Transport Planning.*

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: New Generation And Hybrid Vehicles **Code: 382673(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

UNIT I

INTRODUCTION
Electric and hybrid vehicles, flexible fuel vehicles (FFV), solar powered vehicles, magnetic track vehicles, fuel cells vehicles.

UNIT II

POWER SYSTRM AND NEW GENERATION VEHICLES
Hybrid Vehicle engines, Stratified charge engines, learn burn engines, low heat rejection engines, hydrogen engines, HCCI engine, VCR engine, surface ignition engines, VVTI engines. High energy and power density batteries, fuel cells, solar panels, flexible fuel systems.

UNIT III

VEHICLE OPERATION AND CONTROL
Computer Control for pollution and noise control and for fuel economy – Transducers and actuators - Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

UNIT IV

VEHICLE AUTOMATED TRACKS
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.

UNIT V

SUSPENSION, BRAKES, AERODYNAMICS AND SAFETY
Air suspension – Closed loop suspension, compensated suspension, anti skid braking system, retarders, regenerative braking, safety gauge air backs- crash resistance. Aerodynamics for modern vehicles, safety systems, materials and standards.

TEXT BOOKS

1. Modern Vehicle Technology by Heinz.

2. Bosch Hand Book, SAE Publication,, 2000

REFERENCES

1. Light weight electric for hybrid vehicle design.

2. Advance hybrid vehicle power transmission, SAE.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: Supercharging And Scavenging **Code: 382674(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

UNIT I

SUPERCHARGING
Effects on engine performance – engine modification required Thermodynamics of Mechanical Supercharging and Turbo charging – Turbo charging methods – Engine exhaust manifolds arrangements.

UNIT II

SUPERCHARGERS
Types of compressors – Positive displacement blowers – Centrifugal compressors –Performance characteristic curves – Suitability for engine application – Surging –Matching of supercharger compressor and Engine – Matching of compressor, Turbine, Engine.

UNIT III

SCAVENGING OF TWO STROKE ENGINES
Peculiarities of two stroke cycle engines – Classification of scavenging systems –Mixture control through Reed valve induction – Charging Processes in two stroke cycle engine – Terminologies – Shankey diagram – Relation between scavenging terms –scavenging modelling – Perfect displacement, Perfect mixing – Complex scavenging models.

UNIT IV

PORTS AND MUFFLER DESIGN
Porting – Design considerations – Design of Intake and Exhaust Systems – Tuning.

UNIT V

EXPERIMENTAL METHODS
Experimental techniques for evaluating scavenging – Firing engine tests – Non firing engine tests – Port flow characteristics – Kadenacy system – Orbital engine combustion system.

TEXT BOOKS
1. Watson, N. and Janota, M.S., Turbo charging the I.C. Engine, MacMillan Co., 1982.
2. John B.Heywood, Two Stroke Cycle Engine, SAE Publications, 1997.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: Automotive Aerodynamics **Code: 382675(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

UNIT I

INTRODUCTION
Scope – historical development trends – Fundamentals of fluid mechanics – Flow phenomenon related to vehicles – External & Internal flow problems.–Resistance to vehicle motion – Performance – Fuel consumption and performance – Potential of vehicle aerodynamics.

UNIT II

AERODYNAMIC DRAG OF CARS
Car as a bluff body – Flow field around car – drag force – types of drag force – analysis of aerodynamic drag – drag coefficient of cars – strategies for aerodynamic development – low drag profiles.

UNIT III

SHAPE OPTIMIZATION OF CARS
Front and modification – front and rear wind shield angle – Boat tailing – Hatch back, fast back and square back – Dust flow patterns at the rear – Effect of gap configuration –effect of fasteners.

UNIT IV

VEHICLE HANDLING
The origin of force and moments on vehicle-side wind problems – methods to calculate forces and moments – vehicle dynamics under side winds – the effects of forces and moments – Characteristics of forces and moments – Dirt accumulation on the vehicle – wind noise – drag reduction in commercial vehicles.

UNIT V

WIND TUNNELS FOR AUTOMOTIVE AERODYNAMICS
Introduction – Principles of wind tunnel technology – Limitation of simulation – Stress with scale models – full scale wind tunnels – measurement techniques – Equipment and transducers – road testing methods – Numerical methods.

TEXT BOOK :

1. Hucho,W.H., Aerodynamics of Road vehicles, Butterworths Co. Ltd., 1987.

2. Pope,A., Wind Tunnel Testing, John Wiley & Sons, 2nd Edn., New York, 1974.

REFERENCES :

1. Automotive Aerodynamics: Update SP-706, SAE, 1987.

2. Vehicle Aerodynamics, SP-1145, SAE, 1996.

Chhattisgarh Swami Vivekanand Technical University,Bhilai

Name of the program: Bachelor of Engineering
Branch: Automobile Engineering **Semster: VI**
Subject: Maintenance & Reliability **Code: 382676(82)**
Total Theory Periods: 40 **Total Tutorial Periods: 10**
Class Tests:2(minimum) **Assignments: 2(minimum)**
ESE duration: 3 hours **Maximum Marks: 80** **Minimum marks: 28**

UNIT – I

Maintenance Engineering
Objective and functions, organization and administration, economics and maintenance policies. Types of maintenance systems-planned, unplanned, preventive, predictive, conditional monitoring, total predictive maintenance.

UNIT – II

Failure Analysis
Analysis of source identification, classification and selectivity of failures, catastrophic, wear out and cumulative failures, failure rate Mortality distribution, statistical and reliability concept of failure analysis, equipment replacement policy.

UNIT – III

Reliability Engineering
Concept, bath tub curve, elements, Hazard Models- constant, linearly increasing, weibull. System Reliability - Series configuration, parallel configuration, mixed configuration, reliability improvement – Improvement of components, Redundancy – element, unit, standby, repairable and non repairable systems, reliability, availability, maintainability, MTBF, MTTR, reliability allocation for simple series system.

UNIT – IV

Maintenance Management
Maintenance planning, maintenance scheduling, work orders, work measurement, maintenance cost budgeting, store and spare control, maintenance planning and control techniques, Incentives for maintenance work.

UNIT – V

Maintenance of Mechanical System
Introduction, Bearings, Friction Clutches, Couplings, Fastening Devices, Chains, Gear Drives, Support Equipment, Cooling Towers.

TEXT BOOKS
1. Maintenance Engineering & Management – R.C Mishra, K. Pathak – Prentice Hall of India, New Delhi
2. Maintenance Engineering – S. Shrivastava – S. Chand & Sons – New Delhi

REFERENCE BOOKS
1. Industrial Maintenance – H.P. Garg – S. Chand Publication, New Delhi
2. Maintenance Planning & Control – A. Kelly – TMH, New Delhi
3. Concept in Reliability – LS. Srinath – Affiliated East-West Press, New Delhi