

**UNIVERSITY POLYTECHNIC
B.I.T., MESRA, RANCHI**

Syllabus of Diploma in Engineering (Automobile Engineering) (Semester VI)

**COURSE STRUCTURE
(W.E.F. 2011 Batch Students)
(Total Unit 7.0)**

Course Code	Theory	Unit	Course Code	Sessional	Unit
DAE 6001	Motor Vehicle Maintenance & Repairs	1.0	DAE 6002	Garage Practice II	1.0
DAE 6003	Motor Vehicle Technology-II	1.0	DAE 6012	Project	1.0
DAE 6005	Motor Vehicle, Act, Regulation & Standard	1.0			2.0
DME 6005	Quality Control	1.0			
MBA 6003	Total Quality Management	1.0		Seminar/Industrial Visit (Non-Credit)	0.5
		5.0			

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Subject : Motor Vehicle Maintenance & Automobile Repairs

Code: DAE 6001

Module 1

Inspection of cylinder

Inspection of cylinder wears, Changing of ring set, Measurement of Quality & tapered ness, Cylinder boring, Honing process, changing of liners. (5)

Module 2

Inspections of Crankshaft

Inspections of Crankshaft for wear, ovality & taper, Crankshaft grinding procedure corresponding under sized bearing. Bearing effect of crankshaft & bearing wear on engineering performance. (5)

Module 3

Transmission maintenance

Transmission system maintenance, adjustment of clutch, causes & remedies of gear box faults, causes & remedies of propeller shaft, causes & remedies of differential & Rear axle, inspection & adjustment of brakes, hydraulic brake system & brake bleeding, air assisted hydraulic brakes, air brakes and their adjustment. (7)

Module 4

Body Maintenance

Adjustment of doors and Locks, Frame repairs and alignments, Front wheel alignment procedures & steering linkage, care of wheels & tyres, reclaiming & retreading of tyres, vulcanising, focusing of head lamp and maintenance of electrical accessories. (6)

Module 5

Carburettors Adjustment

Tuning of carburettors, adjustment of idle speed, winter & summer adjustment, float level adjustment, metering pin adjustment. (5)

Module 6

MPFI System

Theories & Maintenance of MPFI System, trouble shooting, and fault diagnosis of MPFI engines, Testing & replacing of sensors and injectors. (6)

Module 7

Painting details

Methods adopted for denting, painting, details of painting equipments, defects in painting. (6)

Books Recommended

1. Automotive mechanics by Williams H Course and Donald
2. Car maintenance and repair by A W Judge Vol. IV
3. Maintenance of high speed diesel engine by A W Judge
4. Automotive Engineering by G B S Narang
5. Automotive Engineering by Kripal Singh
6. Service manual – Maruti, Indica, Santro, Accent etc.

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Subject : Motor Vehicle Technology II

Code: DAE 6003

Module 1

Front Axle & Steering

Introduction & study of front axle assemblies. Types of front Axle:- Dead, Live, Elliot & Lamoine front wheel assembly, Correct steering angle, Steering gearbox, Worm, Wheel Worm & Roller, Rack & Pinion type, Ackerman linkage, Power Steering, and Electronic controlled Power Steering System. 6

Module 2

Suspension Systems.

Principle & necessity of suspension systems, Types of springs (leaf, Coil, Torsion Bar), Front suspension, Stabilizer bar, Rear Suspension, Air Suspension, Shock Absorber, Automatic Lever Control, Introduction of electronic controlled suspension systems. 8

Module 3

Brakes

Principle and necessity, Types of brakes, Hydraulics & Pneumatics, Drums & Disc, Power Brakes, Brake booster, Anti lock Systems, Hand Brake, Brake fluid, Bleeding of brakes. 6

Module 4

Automobile Electrical System

Automobile Electrical Components, charging system, starting system, lighting system. 5

Module 5

Automobile Instrumentation & Accessories

Speedometer, fuel gauge, Temperature gauge, RPM meter, Horn circuits, power door and windows. 5

Module 6

Frames

Introduction, Chassis lubrication, Types of body, constructional details, types of frames & frameless, materials of frames, load consideration, possible defects and remedies. 6

Module 7

Lubricants

Types of lubricants, their uses, properties different lubricants used in various automobile components. 4

BOOKS RECOMMENDED:

1. Automobile Engineering Vol.I & II By Kirpal Singh.
2. Automobile Engineering By G.B.S. Narang.
3. Automotive Mechanics By W.H. Crouse.
4. Harbans Singh Rayat.

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Subject : Motor Vehicle Acts, Regulation & Standard

Code : DAE 6005

Module 1

Motor Vehicle Act (1988) and Definition

Short title, Extent and Commencement, Various technical definition of motor vehicle. 6

Module 2

Licensing of Drivers, Conductors and Driving Procedure

Licensing of drivers and conductors of motor vehicles. Principle of driving, driving procedure, driving precautions, driving in abnormal conditions-Hilly, night, fog, typhoon, heavy traffic & rainy. Recent motor vehicle Acts and Rules. 6

Module 3

Insurance, Registration

Meaning & necessity of insurance, Types of Insurance- life, fire & motor vehicle. Motor vehicle insurance – comprehensive, third party, no fault liability & solecistic fund. Registration of Motor Vehicles. (Old and new), private and commercial vehicles. 4

Module 4

Taxation of Motor Vehicles

Meaning of Taxation. Taxation structure for 2 wheeler, 3 wheeler, goods and passenger vehicle. Method of paying tax. Tax exemption of motor vehicle. 4

Module 5

Control of Motor Vehicle

Control of transport – Permit & exemption in permit. Transfer of Vehicles – Local and state to state Offences, Penalties and procedures. Different type of forms. Transfer of Ownership. 5

Module 6

Road Safety & Traffic Control

Road signs, imposition of penalties for violation of Act and Article, duties of drivers, duties of conductor, duties of helper. Duties and responsibilities of traffic inspector. 7

Module 7

Claims Tribunal, Offences, Penalties & Procedure

Procedure of accident claim and settlement. Furnishing of particulars of vehicle involved in accident. Duty of driver in case of accident and injury. Surveyor and loss assessor – Role, functions of surveyor, loss assessment of accident vehicle procedure, how to claim and where. 8

Books Recommended :

1. Motor Vehicle Acts by N. D. Basu
2. Motor Vehicle Manual by Amerdeep Kaushal
3. Motor Vehicle Manual by V. K. Malhotra

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Subject : Quality Control

Course code : DME 6005

Module 1

Concept of Quality: Definition of quality, cost of quality , value of quality. Quality control, objectives of quality control, quality control and inspection. 5

Module 2

Statistical concepts : Definition of probability, laws of probability. Normal, Binomial & Poisson probability distributions. Statistical Quality Control. 6

Module 3

Control Charts for Variables : Introduction, objectives , theories of control charts for averages , ranges, standard deviations. Process capability study. 5

Module 4

Control Charts for Attributes : Fraction defectives and number of defects. Interpretation of control charts. 5

Module 5

Acceptance Sampling by attributes : Concepts of acceptance sampling , advantages and limitations , sampling methods , single, double and- multiple sampling plants .operating characteristic curves . 7

Module 6

Total Quality Management : Concept of Total Quality management, Principle objectives of TQM. 6

Module 7

ISO 9000 Quality System : History of ISO: 9000, ISO:9000 series in general, benefits by becoming an ISO:9000 company, steps to registration, India and ISO:9000. 6

BOOKS:

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| 1. Statistical Quality Control | by M.Mahajan |
| 2. Quality Planning and Analysis | by J.M .Juran & Frank M Gryna |
| 3. Statistical Quality Control | by Eugene L.Grant & Richard S Leaven worth |
| 4. Total Quality Management | by John M Kelly |
| 5. TQM | by R.P. Mohanty & R.R. Lakhe. |

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Syllabus of Diploma in Engineering (Automobile Engineering) (Semester VI)

Subject : Total Quality Management

Course code : MBA 6003

Module 1

Introduction to Management – Definition, Nature, Objective and functions of Management. Definition of Quality and its importance, Need for quality and Quality movement. (4)

Module 2

Introduction to Total Quality Management, Objective and Scope of TQM, Elements/Components of TQM. (6)

Module 3

Pioneers of TQM, Process of TQM, Need, Significance and Barriers of TQM, Role of Senior Management. (6)

Module 4

Quality Circle - Purpose, Benefits, Problem in implementation of quality circles, Requirements of Elective Circle. (6)

Module 5

Benchmarking - Reasons to Benchmark, Benchmarking Process, Quality Function Development (QFD) – Cost of Quality, QFD Process, Six Sigma. (6)

Module 6

TQM and HRD, Introduction to ISO 9000 and ISO 14000 – Concept, Requirement and Benefits. (6)

Module 7

Statistical Tools and Techniques - Common Statistical Tools, Flow Diagram, Check Sheets and Scatter Plots. (6)

TEXT BOOK:

1. Dr. S. Kumar “Total Quality Management, Laxmi Publications.

REFERENCE BOOKS :

1. S. K. Mandal, “Total Quality Management, Principles & Practice”, Vikas Publishing House, Pvt. Ltd.
2. Narayana V. and Sreenivasan, N.S. “Quality Management – Concepts and Tasks”, New Age International, 1996.
3. K. Sridhar Bhatt, “Total Quality Management” – Himalaya Publishing House.
4. L. M. Prasad, “ Principles& Practices of Management”