SCHEME OF STUDIES & EXAMINATIONS
Department: Automobile Engineering – 6th Semester

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	AE 302B	AUTOMOTIVE FUELS & LUBRICANTS	3	1		25	75	-	100	4	3
2	AE 304B	AUTOMOTIVE TRANSMISSION	3	1		25	75	-	100	4	3
3	AE 306B	AUTOMOTIVE INSTUMENTATION & EMBEDDED SYSTEMS	3	1		25	75	-	100	4	3
4	AE 308B	AUTOMOTIVE CHASSIS DESIGN	3	1		25	75	-	100	4	3
5	AE 310B	AUTOMOTIVE POLLUTION & CONTROL	3	1		25	75	-	100	4	3
6	AE 312B	TWO & THREE WHEELERS	3	1		25	75	-	100	4	3
7	HUM 302B	REPORT WRITING SKILLS (Common for all branches)	1	-	-	25	50	-	75	1	2
7	AE 314B	TWO & THREE WHEELERS LAB	-	-	2	20		30	50	1	3
8	AE 316B	COMPUTER AIDED CHASSIS DESIGN LAB	-	-	2	20		30	50	1	3
9	AE 318B	COMPUTER AIDED ENGINE DESIGN LAB	-	-	2	20		30	50	1	3
10	AE 320B	AUTOMOTIVE ENGINE TESTING &POLLUTION MEASUREMENT LAB	-	-	2	20	-	30	50	1	3
11	HUM 304B	ORAL PRESENTATION SKILLS (Common for all branches)	-	-	2	20	-	30	50	1	2
12	GPAE 302B	GENERAL PROFICIENCY & ETHICS	1	-	-	-	-	75	75	2	-
Total			**19**	**6**	**10**	**275**	**500**	**225**	**1000**	**32**	

Note:

1. Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weight age of Sports is given in General Proficiency & Ethics Syllabus.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
3. Electronics gadgets including Cellular phones are not allowed in the examination
4. Each students has to undergo Professional Training of at least 4 weeks from the industry, institute, research lab, training center etc during summer vacation and its evaluation shall be carries out in the VII semester

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Automotive Fuels & Lubricants (Theory) **Subject Code: AE 302 B**

Detailed Content

UNIT NO.1 Fuels

Topic No.1: Introduction, Structure of petroleum, Refining process & Product of refining process
Topic No.2: Fuels for spark-ignition engines, Knock rating of SI engine Fuels
Topic No.3: Octane number requirement, Diesel fuels
Topic No.4: LPG as SI engine fuel Non petroleum fuel Additives

UNIT NO.2 Alernative Fuels For Ic Engines

Topic No.5: Introduction, Manufacture of methanol, Manufacture of ethanol
Topic No.6: Comparison of properties of alcohols, Gasoline as engine fuels
Topic No.7: Engine performance with pure alcohols
Topic No.8: Alcohol-gasoline fuel blends, Alcohols as diesel fuels
Topic No.9: Vegetable oils as diesel fuels & Bio-gas as diesel fuel

UNIT NO.3 Engine Friction And Lubrication

Topic No.10: Introduction, Total engine friction
Topic No.11: Effect of engine variables on engine friction, Determination of engine friction
Topic No.12: Lubrication principles, Bearing lubrication, Functions of lubricating system
Topic No.13: Properties of lubricating oil, Additives
Topic No.14: Classification of lubricating oils, Service rating of oils
Topic No.15: Lubricating system, Oil filters, Crankcase ventilation
Topic No.16: Engine performance and lubrication.

UNIT NO.4 Tecniques And Procedure

Topic No.17: Find Temperature dependence of viscosity of lubric^{N} oil by Redwood viscometer
Topic No.18: Viscosity index of lubricating oil by Say bolt viscometer
Topic No.19: Flash and fire points of fuels
Topic No.20: Flash and fire points of lubricants, ASTM distillation test of gasoline
Topic No.21: Drop point of grease and Mechanical penetration in grease
Topic No.22: Aniline distillation test of gasoline
Topic No.23: Reid vapour pressure test , Study of Bomb Calorimeter
Topic No.24: Study of Gas Calorimeter

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Mathur and Sharma, “Internal Combustion Engine”, Dhanpat Rai Publications
2. Ganesan, V- “Internal Combustion Engines”- Tata McGraw-Hill

REFERENCES:

3. Obert.E.F.- “Internal Combustion Engines”
4. Taylor. C.F., Internal Combustion Engines, MIT Press.
5. Heywood. J.B., Internal Combustion Engine Fundamentals, McGraw Hill Book

NOTE:

1. In the semester examination, the examiner will set eight questions in all; two question from each unit & students will be required to attempt only five questions, at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

SYLLABUS: B Tech (AUTOMOBILE ENGINEERING)

Department: Automobile – 6th Semester

Subject: Automotive Transmission (Theory) **Subject Code: AE 304 B**

Detailed Content

UNIT NO.1 Clutch And Gear Box

Topic No. 1 : Clutch- Different types of clutches, Cone Clutch, Centrifugal Clutch, Single Plate ClutchMultiple Plate Clutch
Topic No. 2 : Working principles and constructions of Cone Clutch
Topic No. 3 : Working principles and constructions of Centrifugal Clutch
Topic No .4 : Working principles and constructions of Single Plate Clutch
Topic No. 5 : Working principles and constructions of Multiple Plate Clutch
Topic No. 6 : Torque capacity and design aspects, gear Box- method of calculation of gear ratios for vehicles
Topic No. 7 : Performance characteristics in different speeds
Topic No. 8 : Different types of gear boxe, Speed synchronizing device, Gear materials, lubrication

UNIT NO.2 Hydrodynamic Drive &Automotive Transmission

Topic No.9 : All spur and internal gear type planetary gearboxes
Topic No.10: Construction and working of Ford T-model
Topic No.11: Construction and working of Cotal Gear box
Topic No.12: Construction and working of Wilson Gear box
Topic No.13: Determination of gear ratios, Automatic overdrives.
Topic No.14: Fluid coupling-Construction details, Principle, advantages and limitations
Topic No.15: Torque capacity, slip in fluid coupling.
Topic No.16: Performance characteristics; Means used to reduce drag torque in fluid coupling
Topic No.17: Principal of torque conversion, single, multi stage and polyphase torque converters
Topic No.18: Performance characteristics.
Topic No.19: Constructional and operational details of typical hydraulic transmission drives.

UNIT NO.3 Hydrostatic Drive And Electric Drive

Topic No.20: Define Automatic transmission
Topic No.21: Discuss relative merits and demerits when compared to conventional transmission
Topic No.22: Automatic control of gears, Study of typical automatic transmissions
Topic No.23: Ford and Chevrolet drive, Automatic control of gear box.

UNIT NO.4 Automatic Transmission Applications

Topic No.24: Hydrostatic drives advantages and disadvantages
Topic No.25: Principles of hydrostatic drive systems
Topic No.26: Construction and working of typical hydrostatic drives , Explain Janney Hydrostatic drive
Topic No.27: Electrical drives- advantages and limitations. General Electric Drive System
Topic No.28: Principles of Ward Leonard system of control. Principles of Modified Ward Leonard system of control
Topic No.29: Modern electric drive for buses
Topic No.30: Performance characteristics

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Heldt P.M - Torque converters- Chilton Book Co
2. Newton and Steeds - Motor Vehicle- Illiffee Publisher

REFERENCE:

1. Design Practices, passenger Car Automotive Transmissions- SAE Hand book

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Automotive Instrumentation & Embedded Systems (Theory) **Subject Code: AE 306 B**

Detailed Content

UNIT NO.1 Measurement Characterstics, Automotive Instrumentation

Topic No.1: Instrument Classification
Topic No.2: Characteristics of Instruments : Static and dynamic
Topic No.3: Experimental error analysis , Systematic and random errors
Topic No.4: Statistical analysis, Uncertainty, Experimental planning and selection of measuring instruments
Topic No.5: Reliability of instrument, Modern automotive instrumentation
Topic No.6: Computerized instrumentation system, Multiplexing, Sampling and advantages
Topic No.7: Measurements – fuel quality, Coolant temperature, oil pressure ,vehicles speed, Display devices
Topic No.8: LED, LCD, VFD, CRT and types, CAN network, the glass cockpit and information system
Topic No.9: Onboard diagnostics – fault code displays, Off board diagnostics – engine data display
Topic No.10: Expert system occupant protection system , Airbag deployment system security and warning systems

UNIT NO.2 Measurement Analysis

Topic No.11: Chemical, thermal, magnetic and optical gas analyzers
Topic No.12: Measurement of smoke, dust and moisture, Gas chromatography, spectrometry
Topic No.13: Measurement of pH, Review of basic measurement techniques

UNIT NO.3 Introduction To Embedded System

Topic No.14: Introduction to functional building blocks of embedded systems
Topic No.15: Register, memory devices, Instrument Classification, Characteristics of Instruments
Topic No.16: Static and dynamic, Experimental error analysis, Systematic and random errors
Topic No.17: Statistical analysis, Uncertainty, Experimental planning
Topic No.18: Selection of measuring instruments, Reliability of instruments.

UNIT NO.4 Real Time Operating System (Rtos)

Topic No.19: Introduction to basic concepts of RTOS
Topic No.20: Basics of real time & embedded system operating systems
Topic No.21: RTOS – Interrupt handling, task scheduling
Topic No.22: Embedded system design issues in system development process
Topic No.23: Action plan, use of target system
Topic No.24: Emulator, use of software tools.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. William B.Riddens - Understanding Automotive Electronics, 5th edition- Butter worth Heinemann.
2. Rajkamal, 'Embedded System – Architecture, Programming, Design', Tata McGraw Hill.
3. Daniel W. Lewis 'Fundamentals of Embedded Software', Prentice Hall of India.
4. Holman, J.P., Experimental methods for engineers, McGraw-Hill.
5. Raman, C.S., Sharma, G.R., Mani, V.S.V., Instrumentation Devices and Systems, Tata McGraw Hill.

REFERENCES:

1. Bechhold- Understanding Automotive Electronics- SAE.
2. David E. Simon, 'An Embedded Software Primer', Pearson Education.
3. Frank Vahid, 'Embedded System Design – A Unified hardware & Software IntroductionWiley.
4. Sriram V. Iyer, Pankaj Gupte, 'Embedded Real Time Systems Programming', Tata McGraw Hill.
5. Steve Heath, 'Embedded System Design', II edition, Elsevier.

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Automotive Chassis Design (Theory) **Subject Code: AE 308 B**

Detailed Content

UNIT NO.1 Clutch Design Calculation

Topic No.25: Design of single plate clutch , Multi plate clutch
Topic No.26: Design of centrifugal clutch, Cone clutch
Topic No.27: Energy dissipated, torque capacity of clutch, Design of clutch components
Topic No.28: Design details of roller and sprang type of clutch

UNIT NO.2 Gear Box

Topic No.29: Performance of vehicle, total resistance to motion
Topic No.30: Traction and tractive effort, acceleration, Calculation of gear ratio
Topic No.31: Design of three speed gear box, Design of four speed gear boxes

UNIT NO.3 Vehicle Frame And Suspension

Topic No.32: Study of loads, Moments and stresses on frame members
Topic No.33: Design of frame for Passenger and Commercial vehicles
Topic No.34: Design of leaf springs, Design of Coil springs
Topic No.35: Design of Torsion bar spring

UNIT NO.4 Front Axle And Steering Systems , Final Drive And Rear Axle

Topic No.36: Analysis of loads
Topic No.37: Moments and stresses at different sections of front axle
Topic No.38: Determination of loads at kingpin bearings
Topic No.39: Wheel spindle bearings, Choice of bearings
Topic No.40: Determination of optimum dimensions
Topic No.41: Proportions for steering linkages ensuring minimum error in steering
Topic No.42: Design of propeller shaft, Design details of final drive gearing
Topic No.43: Design details of full floating. Semi-floating
Topic No.44: Three quarter floating rear shafts , Rear axle housings

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Giri.N.K- “Automobile Mechanics”- Khanna Publisher, New Delhi
2. Heldt.P.M - “Automotive Chassis”- Chilton Co., New York

REFERENCES:

1. Steeds. W -“Mechanics of Road Vehicles”- Illiffe Books Ltd., London
2. Giles.K.G - Steering, Suspension and tyres”- Illiffe Books Ltd., London
3. Newton Steeds & Garret- “Motor Vehicle”- Illiffe Books Ltd., London
4. Heldt.P.M- “Torque converter” - Chilton Book Co., New York
5. Dean Averns - “Automobile Chassis Design”- Illiffe Books Ltd

NOTE:

3. In the semester examination, the examiner will set eight questions in all; two question from each unit & students will be required to attempt only five questions, at least one question from each unit.
4. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Automobile Pollution & Control (Theory) **Subject Code: AE 310 B**

Detailed Content

UNIT NO. Introduction To Environment, Pollutant Formation In Si Engines

Topic No.45: Vehicle population assessment in metropolitan cities and contribution to pollution
Topic No.46: Effects on human health and environment, global warming
Topic No.47: Types of emission, transient operational effects on pollution
Topic No.48: Pollutant formation in SI Engines
Topic No.49: mechanism of HC and CO formation in Four stroke and two stroke SI engines
Topic No.50: NOx formation in SI engines
Topic No.51: Effects of design and operating variables on emission formation
Topic No.52: Control of evaporative emission.
Topic No.53: Two stroke engine pollution

UNIT NO.2 Pollutant Formation In Ci Engines

Topic No.54: Pollutant formation in CI engines
Topic No.55: Smoke and particulate emissions in CI engines
Topic No.56: Effects of design and operating variables on CI engine emissions
Topic No.57: Nox formation and control
Topic No.58: Noise pollution from automobiles, measurement and standards

UNIT NO.3 Control Of Emissions From Si And Ci Engines

Topic No.59: Design of engine, optimum selection of operating variables for control of emissions
Topic No.60: EGR, Thermal reactors, secondary air injection
Topic No.61: Catalytic converters, catalysts
Topic No.62: Fuel modifications, fuel cells
Topic No.63: Two stroke engine pollution controls.

UNIT NO.4 Measurement Techniques Emission Standards And Test Procedure

Topic No.64: NDIR, FID, Chemiluminescent analyzers
Topic No.65: Gas Chromatograph, smoke meters
Topic No.66: Emission standards
Topic No.67: Driving cycles – USA, Japan, Euro and India.
Topic No.68: Test procedures – ECE, FTP Tests
Topic No.69: SHED Test – chassis dynamometers, dilution tunnels

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

1. Paul Degobert – Automobiles and Pollution – SAE International ISBN-1-56091-563-3.
2. Ganesan, V- “Internal Combustion Engines”- Tata McGraw-Hill Co.

REFERENCES:

1. SAE Transactions- “Vehicle Emission”- 1982 (3 volumes).
2. Obert.E.F.- “Internal Combustion Engines”

NOTE:

5. In the semester examination, the examiner will set eight questions in all; two question from each unit & students will be required to attempt only five questions, at least one question from each unit.
6. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Two & Three Wheelers (Theory) **Subject Code: AE 312 B**

Detailed Content

UNIT NO.1 POWER UNIT

Topic No.1: Two stroke SI engine
Topic No.2: Four stroke SI engine, merits and demerits
Topic No.3: Symmetrical and unsymmetrical port timing diagrams
Topic No.4: Types of scavenging processes, merits and demerits
Topic No.5: Scavenging pumps
Topic No.6: Rotary valve engine
Topic No.7: Fuel system
Topic No.8: Lubrication system
Topic No.9: Magneto coil and battery coil spark ignition system
Topic No.10: Electronic ignition system
Topic No.11: Starting system
Topic No.12: Kick starter system.

UNIT NO.2 CHASSIS AND SUB-SYSTEMS

Topic No.13: Mainframe and its types
Topic No.14: Chassis and shaft drive
Topic No.15: Single, multiple plates and centrifugal clutches
Topic No.16: Gear box and gear control
Topic No.17: Front and rear suspension systems, Shock absorbers
Topic No.18: Panel meters and controls on handle bar

UNIT NO.3 BRAKES, WHEELS AND TYRES

Topic No.19: Drum brake, Disc brakes
Topic No.20: Front and rear brake links
Topic No.21: Spoked wheel, cast wheel, disc Wheel
Topic No.22: Disc types; Tyres and tube

UNIT NO.4 TWO WHEELERS & THREE WHEELERS

Topic No.23: Case study of major Indian models of motorcycles
Topic No.24: Scooters and mopeds, TVS mopeds and motorcycles
Topic No.25: Hero Honda motorcycles, Bajaj scooters and motorcycles
Topic No.26: Yamaha, Enfield motorcycles
Topic No.27: Servicing and maintenance
Topic No.28: Case study of Indian models
Topic No.29: Auto rickshaws, pickup van, delivery van and trailer,
Topic No.30: Maintenance: daily, weekly, monthly, Fault tracing.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOK:

1. Irving.P.E. - Motor Cycle Engineering - Temple Press Book, London

REFERENCES:

1. The Cycle Motor Manual - Temple Press Limited, London
2. Encyclopedia of Motorcycling - 20 volume Marshall, Cavensih, UK
3. Brayant R.V, Vespa - Maintenance and Repair Series – S.Chand & Co., New Delhi
4. Raymond Broad Lambretta - A Practical Guide to maintenance and repair – S.Chand & Co., New Delhi

SYLLABUS: B Tech (Automobile Engineering)

Department: Automobile – 6th Semester

Subject: Report Writing Skills (Theory) **Subject Code: HUM 302 B**

Detailed Content

UNIT NO.1 Report Writing

Topic No.70: Reports: meaning I
Topic No.71: Importance and types
Topic No.72: Structure of reports
Topic No.73: Formats of reports
Topic No.74: Use of illustrations

UNIT NO.2 Writing Of Musiness & Technical Reports

Topic No.75: Preliminary steps and procedure of writing report
Topic No.76: Writing various types of reports on technical, business related topics

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

RECOMMENDED READING:

1. Borowick, Jerome. N. *Technical Communication and its Applications*. New Delhi: PHI, 2000
2. Guffey, Mary Ellen. *Business Communication: Process & Product*. USA: South western College Publishing, 2000.
3. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER:

1. The duration of the exam will be 2 hours.
2. The Question Paper for this theory course shall have three questions in all covering both the units. All will be compulsory with internal choice.
3. Question no. 1 will be of 10 marks. The question may have two/three parts with enough internal choice, covering various components of both the Units.
4. Question no 2 with internal choice will be of 10 marks covering contents of the Unit I. It will be theoretical in nature.
5. Question no 3 will have two parts of 15 marks each. The student will be asked to write reports on business and technical subject/ issue covering contents of Unit II. The emphasis would be on testing the actual report writing on a given business and technical situation/ subject in letter format.

NOTE:

7. In the semester examination, the examiner will set eight questions in all; two question from each unit & students will be required to attempt only five questions, at least one question from each unit.
8. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

SYLLABUS: B Tech (AE)

Department: Automobile Engineering – 6th Semester

Subject: Two & Three Wheelers Lab **Subject Code AE 314B**

LIST OF EXPERIMENTS:

1. Road performance test of a two wheeler using chassis dynamometer.
2. Performance test of a shock absorber.
3. Performance test on coil spring.
4. Two wheeler chain tension test.
5. Brake and Clutch adjustment as per specification.
6. Dismantling and assembling of two wheeler gear box and finding gear ratio.
7. Dismantling and assembling of three wheeler gear box and finding gear ratios.
8. Three wheeler brake and clutch play adjustment
9. Dismantling and assembling of three wheeler steering system.
10. Study of three wheeler chassis frame and power transmissions

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

1. Ten experiments are to be performed in the Semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

SYLLABUS: B Tech (AE)

Department: Automobile Engineering – 6th Semester

Subject: Computer Aided Chassis Design Lab **Subject Code AE 316B**

The students will be required to carry out the following exercises using any one of the educational CAD softwares like Latest version of AutoCAD, I-DEAS, CATIA, SOLID EDGE, PRO-ENGINEER etc

LIST OF EXPERIMENTS:

1. Design and Drawing of clutches as given in Exercise Problems Sheet.
2. Design and Drawing of gear boxes as given in Exercise Problems Sheet
3. Design and Drawing of vehicle frames as given in Exercise Problems Sheet.
4. Design and Drawing of suspension systems as given in Exercise Problems Sheet.
5. Design and Drawing of front axles as given in Exercise Problems Sheet.
6. Design and Drawing of steering systems as given in Exercise Problems Sheet.
7. Design and Drawing of final drives as given in Exercise Problems Sheet.
8. Design and Drawing of rear axles as given in Exercise Problems Sheet.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

1. For class work, the students should be assigned to prepare at least ten drawing sheets covering all units and each topic/ experiment/exercise of the syllabus.
2. For practical examination, the examiner should set a question paper containing total three questions, one questions from each unit covering all units and each topic/experiment/exercise of the syllabus; students are required to attempt all the three questions.

SYLLABUS: B Tech (AE)

Department: Automobile Engineering – 6th Semester

Subject: Computer Aided Engine Design Lab **Subject Code AE 318B**

The students will be required to carry out the following exercises using any one of the educational CAD softwares like Latest version of AutoCAD, I-DEAS, CATIA, SOLID EDGE, PRO-ENGINEER etc

LIST OF EXPERIMENTS:

UNIT I

1. Design and Drawing of Cylinders as given in Exercise Problems Sheet.
2. Design and Drawing of Pistons as given in Exercise Problems Sheet.

UNIT II

3. Design and Drawing of Piston pins and Piston rings as given in Exercise Problems Sheet.
4. Design and Drawing of Connecting Rod Assembly as given in Exercise Problems Sheet.

UNIT III

5. Design and Drawing of Crankshafts, as given in Exercise Problems Sheet.
6. Design and Drawing of Flywheels as given in Exercise Problems Sheet.
7. Design and Drawing of Inlet and Exhaust Valves as given in Exercise Problems Sheet.
8. Design and Drawing of Cam and Camshafts as given in Exercise Problems Sheet.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

3. For class work, the students should be assigned to prepare at least ten drawing sheets covering all units and each topic/ experiment/exercise of the syllabus.
4. For practical examination, the examiner should set a question paper containing total three questions, one questions from each unit covering all units and each topic/experiment/exercise of the syllabus; students are required to attempt all the three questions.

SYLLABUS: B Tech (AE)

Department: Automobile Engineering – 6th Semester

Subject: Automotive Engine Testing & Pollution Measurement Lab **Subject Code AE – 320B**

LIST OF EXPERIMENTS:

1. FOR ENGINE TESTING
2. 1. Study of hydraulic, electrical and eddy current dynamometers
3. 2. Valve timing and port timing diagram
4. 3. Performance test on two wheeler SI engine
5. 4. Performance test on automotive multi-cylinder SI engine
6. 5. Performance test on automotive multi-cylinder CI engine
7. 6. Performance test on variable compression ratio engine
8. 7. Retardation test on I.C. Engines.
9. 8. Heat balance test on automotive multi-cylinder SI engine
10. 9. Heat balance test on automotive multi-cylinder CI engine
11. Morse test on multi-cylinder SI engineStudy of P-θ and P-V diagrams for IC engine with piezo-electric pick up, charge amplifier, angle encoder.
12. FOR POLLUTION MEASUREMENT
13. 1. Pollutant formation in SI engines
14. 2. Pollutant formation in CI engines
15. 3. Control of emissions from SI and CI engines
16. 4. Measurement techniques NDIR, FID, Chemiluminescent Analyzers, Gas Chromatograph, Smoke Meters
17. 5. Emission standards driving cycles USA, Japan, Euro and India
18. 6. Test procedures – ECE, FTP test; SHED test – Chassis Dynamometers, Dilution Tunnels.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

1. Ten experiments five from each section are to be performed in the Semester.
2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus.

SYLLABUS: B Tech (Auto)
Department: Automobile Engineering– 6th Semester

Subject: Oral Presentation Skills **Subject Code: HUM- 304 B**

Detailed Content

OBJECTIVE

To enable students to develop their speaking skills with professional proficiency

COURSE CONTENT

Oral Presentations:
Group Discussion; Mock interviews

Note for the Teacher:

The teacher concerned, by devising her/his method, must preview and review the student's spoken proficiency at the beginning and end of the semester respectively to find the efficacy of the course and degree of improvement in the student.

RECOMMENDED READING

1. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
2. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

Scheme of End Semester Examination (Practical)

An external Practical exam of 30 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the competent authority of the University's.

NOTE:

Students will be tested for their oral communication competence making them participate in Group discussion, mock situations for interview. Students may also be evaluated through a viva conducted by an external examiner.

SYLLABUS: B Tech (Auto)
Department: Automobile Engineering– 6th Semester

Subject: General Fitness For The Profession **Subject Code: GPAE- 302B**

Detailed Content

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance II. Extra Curricular Activities / Community Service, Hostel Activitie **(8 Marks)**
III Technical Activities / Industrial, Educational tour **(8 Marks)**
IV Sports/games **(14 Marks)**
V Moral values & Ethics **(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the committee. **(30 Marks)**

C. Moral values & Ethics

Syllabus - A few topics from the below mentioned books

1. R.R.Gaur, R. Sangal and G.P. Bagaria, " Bagaria, " A foundation course in Human Values and Professional Ethics", Pub: Excel Books, New Delhi-110028.
2. M. Govindrajan, S Natrajan & V.S. Senthil Kumar, " Engineering Ethics (including Human Values)" Eastern Economy Edition, Prentics Hall of India Ltd.

A minor test/Quiz will be conducted during the semesterand It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1 Chairperson of the Department Chairman
2 Senior Most Faculty Counselor Member
3 Vice- Chancellor's Nominee Member

Affiliated Colleges:

1 Director/Principal Chairman
2 Head of the Department/Sr. Faculty Member
3 External Examiner to be appointed by the University Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	-	2	75	-	-	75