RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***1***	***1***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of chassis and engine of an automobile.
LO Description	Identify different components of a given chassis layout.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Meaning of automobile, elements of automobile, classification of automobile, layout of chassis, its parts and operating systems.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	02	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Quiz	Student will be asked to identify components of a given chassis layout.	03	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of term work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	**5**	**0**	**2**	*1*	*2*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of chassis and engine of an automobile.
LO Description	Describe construction and working of an internal combustion engine.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Meaning and classification of I.C. engines, two stroke and four stroke engines, merits and demerits, scavenging, comparison of petrol and diesel engines, firing order, valve timing diagrams.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of a given internal combustion engine.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***1***	***3***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of chassis and engine of an automobile.
LO Description	Identify a given engine component in a given internal combustion engine model.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Basic engine components, cylinder block, cylinder head, gaskets, cylinder liners, types of cylinder liners, piston and piston pin, piston rings, types of piston rings, connecting rod, crank shaft, cam shaft, crankcase, engine valves, flywheel and governor.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	04	Handouts, chalk board, PPT, text book, charts, video film, and lab manual.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to identify given engine components in a given internal combustion engine model.	10	Observation schedule/check-list /rating scales /rubrics	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***2***	***1***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of cooling, lubricating and fuel feed systems of an automobile.
LO Description	Describe construction and working of a given cooling system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Necessity of cooling system, types of cooling system-air cooling and water cooling, air cooling system, types of water cooling system, thermosyphon system and pump circulation system, advantages and disadvantages of air cooling and water cooling systems, the components of water cooling system –fan, radiator, pump and thermostat.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to describe construction and working of a given cooling system.	10	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of progressive test-I

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***2***	***2***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of cooling, lubricating and fuel feed systems of an automobile.
LO Description	Describe construction and working of a given lubrication system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	The necessity of lubrication system, S.A.E rating of lubricants, types of lubrication system, petrol lubrication and high pressure lubrication system.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of a given lubrication system.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	**5**	**0**	**2**	*2*	*3*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of cooling, lubricating and fuel feed systems of an automobile.
LO Description	Describe construction and working of a given fuel system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Conventional fuels and alternative fuels: cetane and octane numbers, types of carburettors, working of simple carburettor, multi point and single point fuel injection systems, different fuel transfer pumps, working of S.U electrical and A.C mechanical pump, fuel filters, fuel injection pump, fuel injectors.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of a given fuel system.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	5	0	2	*2*	*4*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of cooling, lubricating and fuel feed systems of an automobile.
LO Description	Identify a given component of a given cooling/lubricating/fuel feed systems

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Demonstration of construction and working of cooling, lubricating, fuel feed systems	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	00	04	Handouts, chalk board, PPT, text book, charts, video film, and lab manual. .	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to describe Identify given components of a given cooling/lubricating/fuel feed systems	10	Observation schedule/check-list /rating scales /rubrics	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	**5**	**0**	**2**	*3*	*1*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of ignition, transmission and steering systems of an automobile.
LO Description	Describe construction and working of an ignition system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Introduction to ignition system, battery ignition systems and magneto ignition system, electronic ignition system, construction and working of lead acid battery, dry battery elements of charging system, elements of starting system, types of lights used in the automobile: cutout relay, car wiring system	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper pen test	Student will be asked to describe construction and working of given ignition system components.	10	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of progressive test-II

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***3***	***2***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of ignition, power transmission and steering systems of an automobile.
LO Description	Describe construction and working of a power transmission system of an automobile.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	General arrangement of clutch, principle of friction clutches, constructional details of single plate clutch, constructional details of multi-plate clutch, constructional details of centrifugal clutch, necessity for gear ratios in transmission, types of gear boxes, working of sliding mesh gear box, working of constant mesh gear box, syncromesh working of propeller shaft working of propeller shaft, working of universal joint, working of differential, types of rear axle, purpose of front axle,	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of given transmission system components	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	5	0	2	*3*	*3*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain construction and working of ignition, transmission and steering systems of an automobile.
LO Description	Describe construction and working of a steering system of an automobile

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Necessity of steering system, caster, camber and king pin inclination, rack and pinion steering system, and power steering. Steering linkages(1,2)	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of a given steering system components.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***3***	***4***	

COURSE NAME	**STRENGTH OF MATERIALS**
CO Description	Explain construction and working of ignition, transmission and steering systems of an automobile.
LO Description	Identify a given component of ignition/transmission/steering systems of an automobile.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Demonstration of construction and working of ignition, transmission, steering systems	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	00	04	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Quiz	Student will be asked to identify given components of ignition/ transmission/ steering systems of an automobile.	03	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of term work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***4***	***1***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain suspension and braking system, emission and noise control of an automobile.
LO Description	Describe construction and working of suspension and braking system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Necessity of suspension system, torsion bar suspension systems, leaf spring and coil spring suspension system, independent suspension for front wheel and rear wheel, working of telescopic shock absorber functions of brakes, types of brakes used in modern vehicles, working of internal expanding brake, working of disc brake. **Tyres:** Construction, Types, Specifications, causes of tyre wear, measures taken to reduce tyre wear	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	02	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to describe construction and working of given suspension/braking system components.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***4***	***2***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain suspension and braking system, emission and noise control of an automobile.
LO Description	State provisions of Motor vehicle act of India for vehicle registration, driving license, emission and noise control.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Their hazards and controls with reference to motor vehicle act. Motor vehicle act, registration of vehicles, driving license and traffic signals, noise pollution.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	00	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Quiz	Student will be asked to list provisions of Motor vehicle act of India for vehicle registration/driving license/ emission /noise control.	04	Test paper + Rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of term work

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***4***	***3***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain suspension and braking system, emission and noise control of an automobile.
LO Description	Identify a given component of a given suspension/braking system.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Demonstration of construction and working of suspension and braking systems.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	00	04	Handouts, chalk board, PPT, text book, charts, video film and lab manual. .	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to describe construction and working of given components of a given suspension/braking system.	05	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***4***	***4***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain suspension and braking system, emission and noise control of an automobile.
LO Description	Measure exhaust gases of an automobile using exhaust gases analyzer/smoke meter.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Exhaust emission test, fitness, smoke meter, exhaust gases analyzer, catalyst converter.	Interactive classroom teaching, demonstration, quiz, assignments, Tuto rial.	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	04	Handouts, chalk board, PPT, text book, charts, video film and lab manual.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to measure for exhaust gases of an automobile using exhaust gases analyzer/smoke meter.	05	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	*0*	*2*	5	0	2	*5*	*1*	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain service and maintenance practices for an automobile.
LO Description	State differences between conventional, special purpose and modern vehicles.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Special purpose vehicles**-tractor, motor grader, scrappers, excavators, dumper trucks, **Modern vehicles** -electric vehicles, CNG vehicles, Hybrid vehicles.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	05	00	Handouts, chalk board, PPT, text book, charts, video film.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Theory exam	Student will be asked to differentiate between given conventional/special purpose/modern vehicles.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester theory exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***5***	***2***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain service and maintenance practices for an automobile.
LO Description	Practice maintenance, servicing and repairing procedures of a given vehicle.

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Maintenance of Vehicles:** Need and types of maintenance, maintenance procedure of engine, transmission system, electrical system, braking system and steering mechanism, wheel balancing.	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	04	Handouts, chalk board, PPT, text book, charts, video film and lab manual. .	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to supervise maintenance of a given engine/ transmission system/ electrical system/braking system/steering mechanism/wheel alignment and balancing of an automobile.	10	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code			Course Code			CO Code	LO Code	Format No. **4**
		M	***0***	***2***	**5**	**0**	**2**	***5***	***3***	

COURSE NAME	**AUTOMOBILE ENGINEERING**
CO Description	Explain service and maintenance practices for an automobile.
LO Description	Identify problems, their causes and possible remedies of a given faulty automobile.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	**Garage and Service Station**: Types, layout, equipment tools (impact and ratchet wrenches, nut runners and fastening, grinders, sanders and polishers , hammers and scalers , drills, tire buffers ,cutters, nibbler, air files, engraving pen ,caulking gun ,riveters ,jack stands bottle, jacks trolley, jacks balloon, jacks air, hydraulic jacks ,workshop presses, workshop cranes, wheel dollies, torque wrenches ,work light, jump starters, hoses ,couplings ,lubrication, balancers, compressors) and service procedure (problems, causes and remedies).	Interactive classroom teaching, demonstration, quiz, assignments, tutorial	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz/tutorial to make students practice their knowledge.	04	04	Handouts, chalk board, PPT, text book, charts, video film and lab manual.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test by observation	Student will be asked to identify problems, their causes and possible remedies of a given faulty automobile.	10	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end semester practical exam

DIPLOMA IN **MECHANICAL ENGINEERING** SEMESTER: **FIFTH SEMESTER**

SCHEME: **OCBC** COURSE CODE: **502**

NAME OF THE COURSE: **AUTOMOBILE ENGINEERING**

LIST OF SUGGESTED EXPERIMENTS

S. NO.	LO	NAME OF EXPERIMENTS
1	11	Demonstration of construction and working of components of an automobile chassis using engine/model/laboratory setup.
2	12,13	Demonstration of construction and working of components of a petrol engine using engine/model/laboratory setup.
3	12,13	Demonstration of construction and working of components of a diesel engine using engine/model/laboratory setup.
4	21,24	Demonstration of construction and working of cooling system using equipment/model/setup of a petrol engine.
5	21,24	Demonstration of construction and working of cooling system using equipment/model/setup of a diesel engine.
6	22,24	Demonstration of construction and working of lubrication system using equipment/model/setup of a petrol engine.
7	22,24	Demonstration of construction and working of lubrication system using equipment/model/setup of a diesel engine.
8	23,24	Demonstration of construction and working of fuel feed system using equipment/model/setup of a petrol engine.
9	23,24	Demonstration of construction and working of fuel feed system using equipment/model/setup of a diesel engine.
10	41,43	Demonstration of construction and working of suspension system of an automobile using equipment/model/setup.
11	41,43	Demonstration of construction and working of braking system of an automobile using equipment/model/setup.
12	44	Measure exhaust gases emissions of an automobile using exhaust gases analyzer.
13	52,53	Servicing of 1) Two wheelers 2) Three wheelers 3) Four wheelers
14	52,53	Engine tuning and adjustment for 1) Petrol engine 2) Diesel engine
15	52,53	Identification of starting troubles and their rectifications for 1) Petrol engine 2) Diesel engine
16	52,53	Rectification procedure for : (a) Air bleeding (b) Brake adjustment (c) Problems in carburettor (d) Wheel alignment for a four wheelers
17	52,53	Battery servicing and charging.
18	52,53	Repair of punctured tyre and re-treading of tyres.
19	52,53	Study of an auto servicing centre: (a) Layout (b) Instruments/ Tools used (c) Servicing procedures.
20	52,53	Visit of a local auto service centre and prepare a report in respect of: (a) Layout (b) Instruments/ Tools used (c) Servicing/ Reconditioning/ Maintenance procedure.
21	52,53	Collect specifications for 2/3/4 wheeler and prepare a comparison table and their manuals.

RGPV (DIPLOMA WING) BHOPAL	OBE CURRICULUM FOR THE COURSE	FORMAT-3	Sheet No. 1/3

Branch	Mechanical Engineering	Semester	V

Course Code	502	Course Name	AUTOMOBILE ENGINEERING

Course Outcome 1	Explain construction and working of chassis and engine of an automobile.	Teach Hrs	Marks
Learning Outcome 11	Identify different components of a given chassis layout.	02+02	03
Contents	Meaning of automobile, elements of automobile, classification of automobile, layout of chassis, its parts and operating systems.		
Method of Assessment	Quiz (Part of term work)		
Learning Outcome12	Describe construction and working of an internal combustion engine.	04+02	10
Contents	Meaning and classification of I.C. engines, two stroke and four stroke engines, merits and demerits, scavenging, comparison of petrol and diesel engines, firing order, valve timing diagrams.		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 13	Identify a given engine component in a given internal combustion engine model.	04+04	10
Contents	Basic engine components, cylinder block, cylinder head, gaskets, cylinder liners, types of cylinder liners, piston and piston pin, piston rings, types of piston rings, connecting rod, crank shaft, cam shaft, crankcase, engine valves, flywheel and governor.		
Method of Assessment	Laboratory test by observation(Part of lab work)		
Course Outcome 2	Explain construction and working of cooling, lubricating and fuel feed systems of an automobile.		
Learning Outcome 21	Describe construction and working of a given cooling system.	04+02	10
Contents	Necessity of cooling system, types of cooling system-air cooling and water cooling, air cooling system, types of water cooling system, thermosyphon system and pump circulation system, advantages and disadvantages of air cooling and water cooling systems, the components of water cooling system –fan, radiator, pump and thermostat.		
Method of Assessment	Paper pen Test (Part of progressive test-I)		
Learning Outcome 22	Describe construction and working of a given lubrication system.	04+02	10
Contents	The necessity of lubrication system, S.A.E rating of lubricants, types of lubrication system, petrol lubrication and high pressure lubrication system.		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 23	Describe construction and working of a given fuel system.	04+02	10
Contents	Conventional fuels and alternative fuels: cetane and octane numbers, types of carburettors, working of simple carburettor, multi point and single point fuel injection systems, different fuel transfer pumps, working of S.U		

	electrical and A.C mechanical pump, fuel filters, fuel injection pump, fuel injectors.		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 24	Identify a given component of a given cooling/lubricating/fuel feed systems	00+04	10
Contents	Demonstration of construction and working of cooling, lubricating, fuel feed systems		
Method of Assessment	Laboratory test by observation (Part of lab work)		
Course Outcome 3	Explain construction and working of ignition, transmission and steering systems of an automobile.	Teach Hrs	Marks
Learning Outcome 31	Describe construction and working of an ignition system.	04+02	10
Contents	Introduction to ignition system, battery ignition systems and magneto ignition system, electronic ignition system, construction and working of lead acid battery, dry battery elements of charging system, elements of starting system, types of lights used in the automobile: cutout relay, car wiring system		
Method of Assessment	Paper pen Test (Part of progressive test-II)		
Learning Outcome 32	Describe construction and working of a power transmission system of an automobile	04+02	10
Contents	General arrangement of clutch, principle of friction clutches, constructional details of single plate clutch, constructional details of multi-plate clutch, constructional details of centrifugal clutch, necessity for gear ratios in transmission, types of gear boxes, working of sliding mesh gear box, working of constant mesh gear box, syncro mesh working of propeller shaft working of propeller shaft, working of universal joint, working of differential, types of rear axle, purpose of front axle,		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 33	Describe construction and working of a steering system of an automobile	04+02	10
Contents	Necessity of steering system, caster, camber and king pin inclination, rack and pinion steering system, and power steering. Steering linkages(1,2)		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 34	Identify a given component of ignition/transmission/steering systems of an automobile.	00+04	03
Contents	Demonstration of construction and working of ignition, transmission, steering systems		
Method of Assessment	Quiz (Part of term work)		
Course Outcome 4	Explain suspension and braking system, emission and noise control of an automobile.	Teach Hrs	Marks
Learning Outcome 41	Describe construction and working of suspension and braking system.	04+02	10
Contents	Necessity of suspension system, torsion bar suspension systems, leaf spring and coil spring suspension system, independent suspension for front wheel and rear wheel, working of telescopic shock absorber functions of brakes, types of brakes used in modern vehicles, working of internal expanding		

	brake, working of disc brake. **Tyres:** Construction, Types, Specifications, causes of tyre wear, measures taken to reduce tyre wear		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome 42	State provisions of Motor vehicle act of India for vehicle registration, driving license, emission and noise control.	04+00	04
Contents	Their hazards and controls with reference to motor vehicle act. Motor vehicle act, registration of vehicles, driving license and traffic signals. noise pollution.		
Method of Assessment	Quiz (Part of term work)		
Learning Outcome 43	Identify a given component of a given suspension/braking system.	00+04	05
Contents	Demonstration of construction and working of suspension and braking systems		
Method of Assessment	Laboratory test by observation (Part of end semester practical exam)		
Learning Outcome 44	Measure exhaust gases of an automobile using exhaust gases analyzer/smoke meter.	04+04	05
Contents	Exhaust emission test, fitness, smoke meter, exhaust gases analyzer, catalyst converter.		
Method of Assessment	Laboratory test by observation(Part of end semester practical exam)		
Course Outcome 5	Explain service and maintenance practices for an automobile.	Teach Hrs	Marks
Learning Outcome 51	State differences between conventional, special purpose and modern vehicles.	05+00	10
Contents	**Special purpose vehicles**- tractor, motor grader, scrappers, excavators, dumper trucks, **Modern vehicles** -electric vehicles, CNG vehicles, Hybrid vehicles.		
Method of Assessment	Theory exam (Part of end semester exam)		
Learning Outcome52	Practice maintenance, servicing and repairing procedures of a given vehicle.	04+04	10
Contents	**Maintenance of Vehicles:** Need and types of maintenance, maintenance procedure of engine, transmission system, electrical system, braking system and steering mechanism. wheel balancing.		
Method of Assessment	Laboratory test by observation(Part of end semester practical exam)		
Learning Outcome 53	Identify problems, their causes and possible remedies of a given faulty automobile.	04+04	10
Contents	**Garage and Service Station**: Types, layout, equipment tools (impact and ratchet wrenches, nut runners and fastening, grinders, sanders and polishers , hammers and scalers , drills, tire buffers ,cutters, nibbler, air files, engraving pen ,caulking gun ,riveters ,jack stands bottle, jacks trolley, jacks balloon, jacks air, hydraulic jacks ,workshop presses, workshop cranes, wheel dollies, torque wrenches ,work light, jump starters, hoses ,couplings ,lubrication, balancers, compressors) and service procedure (problems, causes and remedies).		

Method of Assessment	Laboratory test by observation (Part of end semester practical exam)