SYLLABUS FOR THE BATCH FROM YEAR 2025 TO 2026

FOR

Diploma in Automobile Engineering

(Credit Based Evaluation and Grading System)

Semester: I-II
EXAMINATIONS: 2025-2026

The Diploma Programme Offered:

- **Diploma in Automobile Engineering (6+6 = 12 Months duration)**

Program Outcomes:

- **Fundamental Knowledge of Automobile Engineering** – Students will gain an understanding of the core principles and concepts of automobile engineering.
- **Enhanced Technical Skills** – The program focuses on improving students' technical abilities to apply knowledge of vehicle science and automobile fundamentals in the field of competitive automotive field.
- **Practical Experience** –Students will develop problem-solving skills by working on real-world scenarios. An ability to design advanced systems for vehicle to match demands with appropriate consideration for factor of safety, social and environmental aspects.
- **Career Readiness & Employability** – The program prepares students to contribute at local, regional and global level by solving complex engineering problems in the field of Automobile and Mechanical related industries.

Name of the Department: Mechanical Engineering Department

In collaboration with

Directorate of Open & Distance Learning and Online Studies

GURU NANAK DEV UNIVERSITY AMRITSAR

Diploma in AUTOMOBILE ENGINEERING (SEMESTER SYSTEM) Offered by Department of Mechanical Engineering in collaboration with Directorate of Open & Distance Learning and Online Studies, Guru Nanak Dev University, Amritsar

Eligibility:

- +2 in any stream with at least 45% marks in aggregate (40% for SC/ST candidates).
- Any student doing Bachelor Degree, Master Degree, M.Phil., Ph.D. from GNDU.

SEMESTER-I

Paper Code	Subject	Marks			Credits
		Internal Assessment	End Term	Total	
ODAME101T	**Introduction to Automobile Engineering**	30	70	100	4
ODAME102T	**Basics of Automobile Engineering**	30	70	100	4
ODAME103T	**Automobile Engines**	30	70	100	4
ODAME104S	**Seminar/ Project/ Case study -I**	00	100	100	4
	Total Marks & Credits	**90**	**310**	**400**	**16**

SEMESTER-II

Paper Code	Subject	Marks			Credits
		Internal Assessment	End Term	Total	
ODAME201T	**Automobile Engine Systems - I**	30	70	100	4
ODAME202T	**Automobile Engine Systems - II**	30	70	100	4
ODAME203T	**Engine Ignition Systems**	30	70	100	4
ODAME204S	**Seminar/ Project/ Case study -II**	00	100	100	4
	Total Marks & Credits	**Total Marks & Credits**	**310**	**400**	**16**

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Subject Name: Introduction to Automobile Engineering

Subject Code: ODAME101T

(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Introduction to Automotive Technology: Introduction, Light commercial vehicle, Medium & Heavy Commercial vehicle, Major parts of Automobiles, Body, Body Types, Chassis, classification of Chassis with respect to fitting of Engines, chassis repair.
Components and their functions: Chassis, power source (engine). Transmission: clutch, gear box, propeller shaft, universal joint, axles, differential and final drive. Electrical system.

Section – B

Components and their functions: Chassis, power source (engine). Transmission: clutch, gear box, propeller shaft, universal joint, axles, differential and final drive. Electrical system.

Section – C

Engine, basic engine parts, Wheel Base, Front overhang, Gear overhang, Wheel Track, Long Wheel–base, Types of frame, types of sections used in frame, frameless or integral frame.

Section - D

Motor Vehicle Act and Safety System: Safety: Motor Vehicle Act, Motor vehicle safety standards, active safety, passive safety, ergonomic consideration in safety.

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Subject Name: Basics of Automobile Engineering

Subject Code: ODAME102T

(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Vehicle layout: Layout of a vehicle. Layout of the front engine rear wheel drive vehicle and explain location and function of major vehicle components and systems in brief. Tools: Shop hand tools, safety standards for vehicles.

Section – B

Auto Mechanics and Safety Precautions: Define auto mechanics, duties of mechanics, future of mechanics, functions of mechanics, causes of accidents, safety precautions while working on engine/vehicles, safety precautions while working with tools..

Section – C

Carburetor: Introduction to carburetor, functions of carburetor, basic types of carburetors, operations of carburetor.

Section - D

Automobile Electrical Systems: Basic Automotive Circuits, starting motor, Starting Devices, Bendix starting Drive, Overrunning clutch drive, Solinoid shift systems, Starting motor troubleshooting

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Subject Name: Automobile Engines

Subject Code: ODAME103T

(Semester – I)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
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Section – A

Engines: Introduction, Classification of automobile engines, Engine cycle, Number of strokes, With respect to fuels use, Number and arrangement of cylinders, Classification based on valve arrangements, Classification based on type of cooling, Classification based on type of valve, Special type engines, Square engines, Fuel cell, Electric vehicles, Engine position.

Section – B

Ignition Systems: Introduction, Qualities of a good ignition system, Battery ignition system, Components of battery ignition system, Ignition coil, Condenser, Contact breaker, Distributer, Ignition Advance, Methods of ignition advance, Spark plug, Classification Sparking Plugs, Spark Plug Gap, Magneto Ignition System, Rotating Armature Type, Rotating magnet type, Low and high tension types, Special type of magneto, Ignition System troubleshooting.

Section – C

Petrol engine principles and fundamentals Introduction, Basic engine nomenclature, Classification of petrol engines, Merits and Demerits of petrol engines Thermodynamic cycle of petrol engine, Four stroke petrol engine, Two stroke petrol engine – Construction, working, Valve & port arrangements, scavenging systems, comparison with 4 stroke engines, Advantages, Disadvantages of two and four stroke petrol engines

Section - D

Supercharging: Necessity of supercharging, Rotary compressors, Turbocharger requirement, Effect of supercharging on power output, mechanical losses, fuel consumption, detonation, Limitations of supercharging.

Diploma in AUTOMOBILE ENGINEERING (SEMESTER SYSTEM) Offered by Department of Mechanical Engineering in collaboration with Directorate of Open & Distance Learning and Online Studies, Guru Nanak Dev University, Amritsar

Subject Name: Automobile Engine System - I

Subject Code: ODAME201T

(Semester – II)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Brakes and Braking system: Introduction, Principle of braking. Function and necessity of brakes. Classification of brakes and braking systems. Construction and working of - Drum brake. Concept of Leading Shoe & Trailing Shoe. Friction materials used for brake shoes and pads, requirements of good braking system, types of brakes.

Section – B

Gear Box: Introduction to gear box, problems occurring during running of vehicle, advantages of gear, types of gear box.

Section – C

Tyre and Rim: Introduction to tyre, functions of tyres, constructions of tyres, tread design pattern, types of tyres, tyre changing.

Section - D

Air Conditioning Systems: Study of A.C. systems in automobiles and their maintenance.

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Subject Name: Automobile Engine System - II

Subject Code: ODAME202T

(Semester – II)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Storage Battery: Principle of lead-acid cells; constructional details of battery plates, separator, container, terminal, vent plug, grouping compound. Electrolyte: specific gravity of electrolyte and it variation with temperature. Effect of charging and discharging of specific gravity. Capacity of battery. Efficiency of battery.

Section – B

Principle of generation of alternator: Constructional details of an alternator. Working of alternators. Advantages over dynamo. Types of alternators. Charging of battery with an alternator. Regulator for alternators.

Section – C

Lighting System: Requirements for automobile lighting. Head lamp - mounting and construction, dipper and full beam, care of headlamp, Lens cleaners. Dynamic headlight beam control, Advanced Front lighting system (AFS) Types of bulbs. Reflector optics. Auxillary lights, Brake light, Fog light, Flasher unit, warning lights and panel lights.

Section - D

Accessories: Fuel and oil pressure gauge, cooling water temperature gauge, electrical speedometer, amperemeter, wind-screen wiper, electrical horn and relay, Odometer, wind-shield washing equipment, engine rpm meter, glow plug indicator. Car heaters, AC, blower and air flow controls, Rear defogger.

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Subject Name: Engine Ignition Systems

Subject Code: ODAME203T

(Semester – II)

Time: 03 Hours **Max. Marks: 100 Marks**

Internal Assessment: 30 Marks

End Term: 70 Marks

Instructions for the Paper-Setter/examiner:

1. Question paper shall consist of **Four sections**.
2. Paper setter shall set **Eight questions** in all by selecting **Two questions** of equal marks from each section. However, a question may have sub-parts (not exceeding four sub-parts) and appropriate allocation of marks should be done for each sub-part.
3. Candidates shall attempt **Five questions** in all, by at least selecting **One question** from each section and the **5th question** may be attempted from any of the **Four sections**.
4. The question paper should be strictly according to the instructions mentioned above. In no case a question should be asked outside the syllabus.

Section – A

Starting System: Principle, construction and working of starter motor. Series motor and its characteristics, Compound wound motor, Engine starting circuit,

Section – B

Ignition System of Spark Ignited Engines: Types of ignition systems- battery-and-coil, magneto ignition systems. Ignition circuit. Details of the ignition system-ignition coil, distributor, condenser, contact breaker points, rotor, distributor cap, distributor drive.

Section – C

Fuel System of Diesel Engine: Fuel supply system. Filters, positioning of filters. Feed pump. Solid and air injection system. Fuel injection pump, different types- plunger, distributor pump, their construction and working. Injectors. Diesel knock. Electronically Controlled Diesel Injection Pump. Common Rail Direct Injection.

Section - D

Fuel System of petrol Engine: Gravity feed system used in 2-wheelers. Fuel supply circuit of 4-wheelers. fuel pump. Electric fuel gauge. Petrol fuel filter. Air/fuel ratio.