CO-PO Attainment B.Voc Automobile

2022-2025 Batch

Course Outcomes and Program Outcome Attainment for Bachelor of Vocation B.Voc Automobile Program

Course outcomes and program outcome attainment for a Bachelor of Vocation (B.Voc) in Automobile program typically include a blend of technical skills, theoretical knowledge, and practical experience relevant to the automotive industry. Here's a generalized outline of potential course outcomes and program outcome attainment for such a program:

Program Educational Outcomes (PEO):

The Objective of the B.VOC Automobile program are to produce graduates who:

1. Have a strong foundation in Automobile systems and Automobile Troubleshooting and Diagnostics with an ability to solve important problems in modern technological society as valuable, productive technicians and supervisors.
2. Have a broad based background to practice B.VOC Automobile in the areas of Automobile Manufacturers, Service Industry, Autotronics, Auto Ancillary industry and Government sectors meeting the growth expectations of stakeholders.
3. Have an ability to pursue higher studies and succeed in academic and professional careers.
4. Have the ability to address professional demands individually and as a team member communicating effectively in technical environment using modern tools.
5. Recognize the need for and possess the ability to engage in lifelong learning.
6. Will be sensitive to consequences of their work both ethically and professionally for productive professional career.

Program Outcomes (PO):

Vocational Education is education that prepares the students for specific trades, crafts and career sat various levels and scopes. It trains the students from a trade/ craft, technician or professional position in R & D organizations.

The Program Outcomes are the skills and knowledge which the students have at each exit level/at the time of graduation. These Outcomes are generic and are common to all exit levels mentioned in the programme structure.

PO 1. **Basic knowledge:** Apply knowledge of basic sciences, basic statistical, and fundamental engineering/ technology to solve the broad spectrum Automobile related problems.

PO 2. **Discipline knowledge & Problem Analysis:** Apply transboundary knowledge of a broad spectrum of technology that encompanses (but not limited to) electronics, mechtronics, electrical, robotics and control system to identify Automobile related problems.

PO 3. **Design Development of solutions:** Design / develop solutions for complex engineering or technological problems or challenges for Automobile related problems

PO 4. **Conduct Investigation of complex problems:** Use research based knowledge and research method including design of experiments/systems, analysis and interpretation of data and synthesis of information to provide valid conclusion

PO 5. **Modern tools:** Apply relevant and recent Automobile technologies and tools with an understanding of the limitations.

PO 6. **The engineer and society:** Assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to practice in field of Automobile.

PO 7. **Environment and sustainability:** Apply Automobile solutions for sustainable development practices in societal and environmental contexts.

PO 8. **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of the practice also in the field of Automobile**.**

PO 9. **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.

PO 10. **Communication:** Communicate effectively in oral and written form.

PO 11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member and leader in a team, to complete project in any environment.

PO12. **Life-long learning:** Engage in independent and life-long learning activities in the context of technological changes also in the Automobile based industry.

Program Specific Objectives (PSO):

After 3-4 years of completion of the program, students will be able to -

1. Apply knowledge of motor vehicles, their manufacturing and servicing & repair technology in solving complex problems in automotive field.
2. Design systems for motor vehicles, their manufacturing & servicing & repair sectors.
3. Diagnose faults in motor vehicles and its systems.

B.Voc Automobile First Year

1. CO-PO-PSO Articulation Matrix for Course Code AUVOC 101: Linguistic Proficiency (English)

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Apply grammatical tools to formulate correct sentences in English.										**H(2)**						
Apply concept of tenses to formulate correct sentences in English.										**H(2)**						
Formulate different types of dialogues, expression of ideas/information in English										**H(2)**						
Compose applications, reports, requests, responses, summary and comprehensions in English										**H(2)**						

2. CO-PO-PSO Articulation Matrix for Course Code AUVOC 102 Basic Automobile Systems [ASC/N 1402]

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**		**PSO1**	**PSO2**	**PSO3**
Explain the auto component manufacturer specifications related to thevarious components/aggregates in thevehicle.	H**(2)**	M**(2)**												H**(2)**		
Explain functioning of Basic Automobile systems components and aggregates ofa vehicle.	H**(2)**	M**(2)**												H**(2)**		

3. CO-PO-PSO Articulation Matrix for Course Code AUVOC 103 Engineering Drawing

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**		**PSO1**	**PSO2**	**PSO3**
Know the importance of drawing standards and drawing basics to prepare drawing.			H**(2)**												H**(2)**	
Visualize geometrical solids and draw orthographic projections for given solid.			H**(2)**												H**(2)**	
Demonstrate ability to prepare projections of points, lines, planes, solids.			H**(2)**												H**(2)**	
Draw and interpret section of solids			H**(2)**												H**(2)**	
Draw isometric view and projections for given orthographic projections.			H**(2)**												H**(2)**	

4. CO-PO-PSO Articulation Matrix for Course Code AUVOC 104 Basic Auto Electrical Systems

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Describe the different possible types of electrical problems.		H(3)														H(3)
Describe how each of the major types of electrical test equipment are connected and interpreted.		H(3)														H(3)
Explain how to use a DMM for diagnosing electrical and electronic systems.		H(3)														H(3)
Explain how to use an oscilloscope for diagnosing electrical and electronic systems.		H(3)														H(3)

5. CO-PO-PSO Articulation Matrix for Course Code AUVOC 105 Laboratory Course I

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Ensure that for routine maintenance and service the correct spare parts and appropriate grade of lubricant, coolants, oils and grease required have been obtained.				H(3)												H(3)
Ensure all dismantled components (including mechanical aggregates are cleaned and conditioned prior to reassembly).				H(3)												H(3)
Identify and change components requiring change due to continuous wear and tear.				H(3)												H(3)
Comply with organisation's current health, safety and security policies and procedures comply with organisation's current health, safety and security policies and procedures.				H(3)												H(3)
Report any identified breaches in health,				H(3)												H(3)

safety, and security policies and procedures to the designated person.																
Coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all incorporating all government norms esp. for emergency situations like fires, earthquakes etc.				H(3)												H(3)
Test common electrical components.				H(3)												H(3)
Use wiring diagrams to identify circuits and circuit problems.				H(3)												H(3)
Diagnose common electrical problems.				H(3)												H(3)
Properly repair wiring and connectors.				H(3)												H(3)
Read electrical automotive diagrams.				H(3)												H(3)
Perform troubleshooting procedures using meters, testlights, and jumper wires.				H(3)												H(3)

6. CO-PO-PSO Articulation Matrix for Course Code VOC 106 Laboratory Project-I

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**		**PSO1**	**PSO2**	**PSO3**
Critical thinking in problem solving		H(3)												H(3)		
Presentation and communication skills		H(3)												H(3)		
Report organization and writing skills		H(3)												H(3)		
Independent learning and information integration skills		H(3)												H(3)		
Project management skill		H(3)												H(3)		

7. CO-PO-PSO Articulation Matrix for Course Code AUVOC201: Industry Safety Practices

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Discuss basic postulates of safe work environment and practices							H(2)							M(2)		
Recognize threats of fatigue, accidents, hazards and Personal Protection							H(2)							M(2)		
Adapt safe working practices							H(2)							M(2)		
Correlate legal aspects of safety and necessary preventive measures in workplace							H(2)							M(2)		

8. CO-PO-PSO Articulation Matrix for Course Code AUVOC 202: Engine Electrical Systems

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain battery operation, battery design and cell groups.			H(3)												H(3)	
Describe the operation of starting motor and starter solenoid.			H(3)												H(3)	
Describe ignition system operation.			H(3)												H(3)	
Describe fouled spark plug condition.			H(3)												H(3)	
Diagnose charging system problems			H(3)												H(3)	

9. CO-PO-PSO Articulation Matrix for Course Code AUVOC 203 Fuel Injection and Ignition System

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain Fuel system S.I. engine.	H(3)													H(3)		
Explain Fuel system C.I. engine.	H(3)													H(3)		
Explain Air Induction and Exhaust System.	H(3)													H(3)		
Explain Throttle Body and Port Fuel Injection System.	H(3)													H(3)		

10. CO-PO-PSO Articulation Matrix for Course Code AUVOC 204 ENGINE CONTROL SYSTEMS

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain engine control system and its components.		H(1)												H(1)		
Describe the working of sensors and module in engine control systems.		H(1)												H(1)		
Describe injection system operations.		H(1)												H(1)		
Carry out On board diagnostics.		H(1)												H(1)		
Diagnose and maintain the engine control system.		H(1)												H(1)		

11. CO-PO-PSO Articulation Matrix for Course Code AUVOC205 Laboratory Course II

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Perform basic battery maintenance and tests		H(2)														H(2)
Perform maintenance, diagnosis and service of battery charging system.		H(2)														H(2)
Diagnose and test starting motor		H(2)														H(2)
Inspect alternator belt and adjust belt tension.		H(2)														H(2)
Do ignition system maintenance diagnosis and service		H(2)														H(2)

12. CO-PO-PSO Articulation Matrix for Course Code VOC 206 Laboratory Project-I

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Critical thinking in problem solving				H(2)										H(2)		
Presentation and communication skills				H(2)										H(2)		
Report organization and writing skills				H(2)										H(2)		
Independent learning and information integration skills				H(2)										H(2)		
Project management skill				H(2)										H(2)		
Work as an individual, with support from a supervisor, formulating solutions to day-to-day problems by integrating knowledge and experience gained on the course and outside the course.				H(2)										H(2)		

B.Voc Automobile Second Year

1. **CO-PO-PSO Articulation Matrix for Course Code AUVOC301: Energy and Environment**

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**		**PSO1**	**PSO2**	**PSO3**
Describe basic concepts of conventional and non-conventional energy							H(2)							H(2)		
Recognize elements of primary non-conventional energy resources							H(2)							H(2)		
Correlate pollution, role of human being, and threats to environment							H(2)							H(2)		
Discuss ethical and legislative issues related to environment							H(2)							H(2)		
Express the needs and basic routes towards environment sustainability							H(2)							H(2)		

2. CO-PO-PSO Articulation Matrix for Course Code AUVOC302- Suspension and Steering System

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain the purpose function, objective and requirements of suspension system.			H(2)												H(2)	
Name and describe the different types of suspension system currently being used and how they function			H(2)												H(2)	
Explain the air bag system components and its operation			H(2)												H(2)	
Describe the steering columns and linkages, different steering system.			H(2)												H(2)	

3. CO-PO-PSO Articulation Matrix for Course Code AUVOC303A: Tires and Braking System

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Perform the work operations required to change a vehicle's wheels/tires..		H(2)													H(2)	
Functionality and design of various tires		H(2)													H(2)	
Explain the construction and operation of braking systems and components.		H(2)													H(2)	
Explain the principles and components of an ABS system and electrical components.		H(2)													H(2)	

4. CO-PO-PSO Articulation Matrix for Course Code AUVOC303B Automotive Fuel and Emission Control System

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain Emission Control System.			H(2)												H(2)	
Explain Precombustion Emission Control System.			H(2)												H(2)	
Explain Evaporative Emissions Control			H(2)												H(2)	
Explain Post Combustion Emission Control System			H(2)												H(2)	

5. CO-PO-PSO Articulation Matrix for Course Code AUVOC304A Automobile Transmission System

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Identify the components of transmission system		H(3)												H(3)		
Analyze the steering system		H(3)												H(3)		
Demonstrate the functional requirement of automobile transmission		H(3)												H(3)		
Demonstrate the construction and working of Differential Mechanism		H(3)												H(3)		
Explain working of Electronic Automatic Transmission		H(3)												H(3)		

6. CO-PO-PSO Articulation Matrix for Course Code AUVOC304B Automobile Body Repair Technology

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Explain construction details of a body component	H(2)													H(2)		
Explain the different process is involved in coach work	H(2)													H(2)		
Explain the maintenance procedure of vehicle body	H(2)													H(2)		
Explain the different painting processes	H(2)													H(2)		
Describe different refinishing process	H(2)													H(2)		

7. CO-PO-PSO Articulation Matrix for Course Code AUVOC305 Laboratory Project-III

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
To carry out the maintenance of suspension system.				H(3)											H(3)	
To perform the suspension system diagnosis and service.				H(3)											H(3)	
To perform the maintenance and diagnosis procedure of steering columns.				H(3)											H(3)	
To perform the maintenance and diagnosis procedure of manual steering gear				H(3)											H(3)	
To carry out the manual steering gear service.				H(3)											H(3)	
Inspect tire condition; identify tire wear patterns; check and adjust air Pressure; determine necessary action				H(3)											H(3)	
Find the correct work methods and tools to use in changing wheels/tires and maintenance				H(3)											H(3)	
Identify and inspect brake system				H(3)											H(3)	

components; determine necessary action.																

8. CO-PO-PSO Articulation Matrix for Course Code AUVOC306 Major Project-III/Industrial Project-III

L= Low Correspondence; M= Moderate Correspondence; H= High Correspondence

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12		PSO1	PSO2	PSO3
Critical thinking in problem solving				H(3)										H(3)		
Presentation and communication skills				H(3)										H(3)		
Report organization and writing skills				H(3)										H(3)		
Independent learning and information integration skills				H(3)										H(3)		
Project management skill				H(3)										H(3)		
Work as an individual, with support from a supervisor, formulating solutions to day-to-day problems by integrating knowledge and experience gained on the course and outside the course.				H(3)										H(3)		

Summary of the Course Outcome (CO) attainment for the mentioned courses:

AUVOC 101: Linguistic Proficiency (English): The course outcomes have a high correspondence with PO9.
AUVOC 102 Basic Automobile Systems [ASC/N 1402]: The course outcomes have a high correspondence with PO1 and PO2, and a moderate correspondence with PSO1.
AUVOC 103 Engineering Drawing: The course outcomes have a high correspondence with PO3 and PSO1.
AUVOC 104 Basic Auto Electrical Systems: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC 105 Laboratory Course I: The course outcomes have a high correspondence with PO1 and PSO1.
VOC 106 Laboratory Project-I: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC201: Industry Safety Practices: The course outcomes have a high correspondence with PO6 and PO11, and a moderate correspondence with PSO2.
AUVOC 202: Engine Electrical Systems: The course outcomes have a high correspondence with PO3 and PSO1.
AUVOC 203 Fuel Injection and Ignition System: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC 204 ENGINE CONTROL SYSTEMS: The course outcomes have a high correspondence with PO2 and PSO1.
AUVOC205 Laboratory Course II: The course outcomes have a high correspondence with PO1 and PSO1.
VOC 206 Laboratory Project-I: The course outcomes have a high correspondence with PO9 and PSO1.
AUVOC301: Energy and Environment: The course outcomes have a high correspondence with PO6 and PO11, and a moderate correspondence with PSO2.
AUVOC302- Suspension and Steering System: The course outcomes have a high correspondence with PO3 and PSO1.
AUVOC303A: Tires and Braking System: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC303B Automotive Fuel and Emission Control System: The course outcomes have a high correspondence with PO3 and PSO1.
AUVOC304A Automobile Transmission System: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC304B Automobile Body Repair Technology: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC305 Laboratory Project-III: The course outcomes have a high correspondence with PO1 and PSO1.
AUVOC306 Major Project-III/Industrial Project-III: The course outcomes have a high correspondence with PO1 and PSO1.

AUVOC 101- Attainment Level 2
AUVOC 102- Attainment Level 2
AUVOC 103- Attainment Level 2
AUVOC 104- Attainment Level 3
AUVOC 105- Attainment Level 3
AUVOC 106- Attainment Level 3
AUVOC 201- Attainment Level 2
AUVOC 202- Attainment Level 3
AUVOC 203- Attainment Level 2
AUVOC 204- Attainment Level 3
AUVOC 205- Attainment Level 3
AUVOC 206- Attainment Level 3
AUVOC 301- Attainment Level 2
AUVOC 302- Attainment Level 2
AUVOC 303- Attainment Level 2
AUVOC 304- Attainment Level 3
AUVOC 305- Attainment Level 3
AUVOC 306- Attainment Level 3

Sd/-

Director

DDU Kaushal Kendra