B. VOC

In

AUTOMOBILE SERVICING TECHNOLOGY (UGC)

Program Learning Outcomes:
PLO1: Diagnose and repair all major vehicle systems.
PLO2: Document repairs of vehicles accurately and description of concern, cause, and correction.
PLO3: Effectively locate and utilize technical information required for vehicle repairs.
PLO4: Work safely and responsibly within all shop standards and environmental guidelines.
PLO5: Demonstrate a comprehensive understanding of automotive systems, including engines, transmissions, brakes, steering, suspension, electrical, and electronic components.
PLO6: Develop the ability to accurately diagnose vehicle problems using diagnostic tools and equipment.
PLO7: Acquire the skills to perform a variety of automotive repairs and maintenance tasks efficiently and effectively.
PLO8: Gain expertise in working with automotive electrical and electronic systems, including wiring, sensors, and computer modules.
PLO9: Develop the ability to optimize engine performance through adjustments, modifications, and troubleshooting.

TOTAL DURATION OF COURSE: 3 Years

- ✓ After completion of Year - 1 Diploma is awarded.
- ✓ After completion of Year - 2 Advance Diploma is awarded.
- ✓ After completion of Year - 3 B. VOC Degree is awarded.

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 1 - Diploma (SEMESTER - I)

Corresponding NSQF Level 5

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 101 ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS	Generic	Theory	30	70	-	-	3	1	-
UAMV - 101 FUNDAMENTALS OF AUTOMOBILE ENGINEERING	Skill	Theory	30	70	-	-	3	1	-
UAMV - 102 WORKSHOP SCIENCE & TECHNOLOGY	Skill	Theory	30	70	-	-	3	1	-
UAMV - 191 FUNDAMENTALS OF AUTOMOBILE ENGINEERING LAB	Skill	Practical	-	-	40	60	-	-	3
UAMV - 192 WORKSHOP SCIENCE & TECHNOLOGY LAB	Skill	Practical	-	-	40	60	-	-	3
UAMV – 193 ENGINEERING DRAWING	Skill	Practical	-	-	40	60	-	-	4
UGEN – 181 ENGLISH LANGUAGE LAB	Generic	Sessional	-	-	-	100	-	-	2
UGEN - 182 COMPUTER FUNDAMENTALS & IT	Generic	Sessional	-	-	-	100	-	-	4

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 1 - Diploma (SEMESTER - II)

Corresponding NSQF Level 5

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UAMV - 201 URBAN TRANSPORTATION REQUIRMENT & PLANNING	Skill	Theory	30	70	-	-	3	1	-
UAMV - 202 BASIC ELECTRICAL & ELECTRONICS	Skill	Theory	30	70	-	-	3	1	-
UAMV – 203 PETROL ENGINE	Skill	Theory	30	70	-	-	3	1	-
UAMV – 291 BASIC ELECTRICAL & ELECTRONICS LAB	Skill	Practical	-	-	40	60	-	-	2
UAMV – 292 PETROL ENGINE LAB	Skill	Practical	-	-	40	60	-	-	2
UAMV - 281 PRACTICE SESSION ON URBAN TRANSPORTATION REQUIRMENT & PLANNING	Skill	Sessional	-	-	-	100	-	-	2
UGEN - 281 SOFT SKILL & PERSONALITY DEVELOPMENT	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 282 BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	Generic	Sessional	-	-	-	100	-	-	4
UAMV - 282 ON JOB TRAINING	Skill	Sessional	-	-	-	100	-	-	6

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 2 - Advanced Diploma (SEMESTER - III)

Corresponding NSQF Level 6

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UAMV – 301 CAD	Skill	Theory	30	70	-	-	3	1	-
UAMV - 302 DIESEL ENGINE	Skill	Theory	30	70	-	-	3	1	-
UAMV - 303 AUTOMOBILE BODY & CHASSIS ENGINEERING	Skill	Theory	30	70	-	-	3	1	-
UAMV - 391 CAD LAB	Skill	Practical	-	-	40	60	-	-	2
UAMV – 392 DIESEL ENGINE LAB	Skill	Practical	-	-	40	60	-	-	3
UAMV - 393 AUTOMOBILE BODY & CHASSIS ENGINEERING LAB	Skill	Practical	-	-	40	60	-	-	3
UGEN - 381 VALUE EDUCATION & HUMAN RIGHTS	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 382 BASIC ACCOUNTING	Generic	Sessional	-	-	-	100	-	-	4

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 2 - Advanced Diploma (SEMESTER - IV)

Corresponding NSQF Level 6

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UAMV - 401 VEHICLE PERFORMANCE AND TESTING	Skill	Theory	30	70	-	-	3	1	-
UAMV - 402 AUTOMOTIVE SAFETY	Skill	Theory	30	70	-	-	3	1	-
UAMV - 403 AUTO ELECTRICAL SYSTEMS & TRANSMISSION	Skill	Theory	30	70	-	-	3	1	-
UAMV - 491 VEHICLE PERFORMANCE AND TESTING LAB	Skill	Practical	-	-	40	60	-	-	2
UAMV - 492 AUTOMOTIVE SAFETY LAB	Skill	Practical	-	-	40	60	-	-	2
UAMV - 493 AUTO ELECTRICAL SYSTEMS & TRANSMISSION LAB	Skill	Practical	-	-	40	60	-	-	2
UGEN - 481 ENVIRONMENTAL STUDIES	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 482 QUALITY MANAGEMENT	Generic	Sessional	-	-	-	100	-	-	4
UAMV – 481 ON JOB TRAINING	Skill	Sessional	-	-	-	100	-	-	6

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 3 - Degree (SEMESTER - V)

Corresponding NSQF Level 7

Course	Component	Theory / Practical / Sessional	Internal (Theory/Skill)	External (Theory/Skill)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UAMV - 501 TWO AND THREE WHEELERS	Skill	Theory	30	70	-	-	3	1	-
UAMV - 502 AUTOMOTIVE AIR CONDITIONING	Skill	Theory	30	70	-	-	3	1	-
UAMV - 503 MOTOR VEHICLE ACT & POLLUTION CONTROL	Skill	Theory	30	70	-	-	3	1	-
UAMV - 591 TWO AND THREE WHEELERS LAB	Skill	Practical	-	-	40	60	-	-	4
UAMV - 592 AUTOMOTIVE AIR CONDITIONING LAB	Skill	Practical	-	-	40	60	-	-	3
UAMV - 581 PRACTICE SESSION ON MOTOR VEHICLE ACT & POLLUTION CONTROL	Skill	Sessional	-	-	-	100	-	-	3
UGEN - 581 INDIAN ECONOMY & SOCIAL CHANGES	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 582 RESEARCH METHODOLOGY	Generic	Sessional	-	-	-	100	-	-	4

Maulana Abul Kalam Azad University of Technology, West Bengal

(Formerly West Bengal University of Technology)

B.Voc. in Automobile Servicing Technology (UGC)

(Effective for Academic Session 2024-2025)

Year - 3 - Degree (SEMESTER - VI)

Corresponding NSQF Level 7

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory/Skill)	Internal (Practical/Skill)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 681 GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Sessional	-	-	-	100	-	-	4
UGEN - 682 ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Sessional	-	-	-	100	-	-	4
UAMV - 681 INDUSTRIAL TRAINING	Skill	Sessional	-	-	-	100	-	-	14
UAMV – 691 MAJOR PROJECT	Skill	Practical	-	-	40	60	-	-	8

Year - 1 Diploma (SEMESTER - I)

Paper Title: UGEN – 101: ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS

Course Objectives:

- Enhance students' ability to express ideas clearly, concisely, and coherently in both oral and written forms.
- Expand students' vocabulary, grammar, and pronunciation to facilitate effective communication.
- Encourage students to analyze information, evaluate arguments, and form independent judgments.
- Develop students' awareness and appreciation of different cultures through language study.

Course Outcomes:

CO1: Demonstrate proficiency in oral and written communication across various contexts, including academic, professional, and interpersonal settings.
CO2: Utilize critical thinking and problem-solving skills to analyze and interpret information, and to construct clear and coherent arguments.
CO3: Exhibit a strong command of English grammar, vocabulary, and pronunciation, enabling accurate and appropriate language use.
CO4: Demonstrate understanding and appreciation of diverse cultures, and effectively interact with people from different backgrounds.

UNIT - I

The Sentence and Its Structure - How to Write Effective Sentences - Phrases - What Are They? - The Noun Clauses - The Adverb Clause - The Relative Clause - How the Clauses Are Conjoined - Word - Classes and Related Topics - Understanding the Verb - Understanding the Auxiliary Verb - Understanding the Adverbs - Understanding the Pronoun - Prepositions.

UNIT - II

Spelling and Pronunciation - Pronunciation, The Tense and Related Topics - Presentness and Present Tenses - The Presentness of a Past Action - Interrogatives and Negatives - Negatives - How to Frame Questions - What‘s What? - Polite Expressions - Some Time Expressions - In Conversation – Letter Writing - Academic Assignments.

UNIT - III

Self - Assessment; Identifying Strength & Limitations; Habits, Will - Power and Drives, Developing Self - Esteem and Building Self - Confidence, Significance of Self - Discipline, Understanding Perceptions, Attitudes, and Personality Types, Mind - Set: Growth and Fixed, Values and Beliefs, Motivation and Achieving Excellence; Self - Actualization Need; Goal Setting, Life and Career Planning , Constructive Thinking, Communicating Clearly: Understanding and Overcoming barriers.

UNIT - IV

Active Listening, Persuasive Speaking and Presentation Skills, Conducting Meetings, Writing Minutes, Sending Memos and Notices; etiquette: Effective E - mail Communication; Telephone Etiquette, Body Language in Group Discussion and Interview.

Books Recommended:

- Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.
- Kulbhushan Kumar, Effective Business Communications, Khanna Publishing House (AICTE Recommended-2018)
- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: HarperCollins E - books, 2007.
- Petes S. J. , Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw - Hill Education, 2011.
- Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.

Paper Title: UGEN – 181 ENGLISH LANGUAGE LAB

Planning for Practical session: (Based on UGEN – 101)

- Conversation classes on contemporary issues
- Writing of corporate CVs
- PPT presentation on selected issues
- Group discussion
- Tips to face the interviews and mock sessions

Paper Title: UAMV – 101: FUNDAMENTALS OF AUTOMOBILE ENGINEERING

Job Role: Automobile Junior Technician

Course Objectives:

- Understand the Basics of Automotive Systems: Provide students with a foundational knowledge of the primary components and systems in modern automobiles, including the engine, transmission, suspension, and braking systems.
- Learn Vehicle Dynamics and Performance: Introduce students to the principles of vehicle dynamics, including handling, stability, and performance metrics. Equip students with the skills to analyze and evaluate vehicle performance.
- Explore Automotive Design and Manufacturing: Familiarize students with the basic concepts of automotive design and manufacturing processes, including materials, manufacturing techniques, and quality control.
- Develop Problem-Solving Skills: Encourage students to apply theoretical knowledge to practical problems in automobile engineering, enhancing their ability to diagnose and solve common automotive issues.

Course Outcome:

CO1: Comprehensive Knowledge of Automotive Systems: Students will be able to identify and describe the key components of an automobile and explain their functions and interactions within the vehicle.

CO2: Assessment of Vehicle Performance: Students will be capable of analyzing and interpreting vehicle performance data, including acceleration, braking, and handling characteristics, to assess and improve vehicle dynamics.

CO3: Understanding of Automotive Design and Manufacturing: Students will demonstrate an understanding of basic automotive design principles and manufacturing processes, including the selection of materials and production techniques.

CO4: Practical Problem-Solving Skills: Students will be proficient in applying engineering principles to diagnose and resolve common issues in automobile systems, using both theoretical knowledge and practical experience.

UNIT - I

Introduction: Classification of automobiles - according to number of wheels, propulsion systems, transmission drives, type of fuels, application & capacity, study of main specifications. Components of an automobile functions & layout of frame, frameless construction, axles, steering system, suspension system, braking system, power train & drives, clutch, gear box, final drive, propeller shaft, u - joints, vehicle body, wheels, tyres & tubes.

UNIT - II

Power Unit: Selection of engine for two wheeler, three wheeler & four wheeler vehicles; constructional & working details of two strokes & four stoke petrol & diesel engines, fuel system, ignition system, starting system, charging system, lighting system, cooling system, lubrication system, combustion & combustion chambers.

UNIT - III

Steering System and Suspension System: Steering system - requirements, front axle details & steering geometry, castor, camber, toe in, toe out steering axis inclination, steering linkages, and different types of steering gear boxes, their constructional & working details. Concept and working of power steering. Need, types of suspension systems, constructional details, characteristics of laminated, coil springs. Introduction to independent suspension, front & rear suspension systems of the vehicle, shock absorbers.

UNIT - IV

Wheels, Tyres & Braking System: Wheel requirements, types of wheels, their constructional & working details, rims & tyres, types of tyres, tyre selection, ordinary, radial tyres tubeless tyres, their constructional details, comparison & application, wheel balancing. Need and classification of brakes, drum brakes and disc brakes, constructional & working details, introduction to hydraulic brake, parking brake, vacuum assisted hydraulic brakes, air assisted hydraulic brakes, air brakes, leading & trailing brake shoes, self energizing brakes & ABS, working of master cylinder, wheel cylinders, tandem master cylinder, characteristics of brake fluid.

Books Recommended:

- A.K. Babu, Automobile Mechanics, Khanna Publishing House (AICTE Recommended Textbook)
- K. K. Ramalingam, "Automobile Engineering", Scitech Publication, Chennai
- Tom Denton, "Automobile Mechanical and Electrical Systems" Indian Ed. , Routledge(T&F Group)Pub
- P. L. Kohli, "Automotive Chassis & Body", Tata McGraw Hill, New Delhi
- Newton Steeds and Garrot "Motor Vehicles", Butterworths, London.
- Judge A. W, "Mechanism of the Car", Chapman and Halls Ltd. , London.
- Crouse W. H, "Automotive Chassis and Body", Mcgraw - Hill, New York.
- K. K. Jain, R. B. Asthana, "Automobile Engineering", Tata McGraw Hill, New Delhi
- Dr. Kirpal Singh, "Automobile Engineering (Vol - 1)", Standard Publisher Distributors

Paper Title: UAMV - 191 FUNDAMENTALS OF AUTOMOBILE ENGINEERING LAB

List of Experiments: (Based on UAMV – 101)

- Identification of different chassis components of a vehicle.
- Identification of different components of S.I. engine.
- Identification of different components of C.I. engine.
- Identification of different components of lubrication system of an engine.
- Identification of different components of cooling system of an engine.
- Identification of different components of fuel supply system of S.I. engine.
- Identification of different components of fuel supply system of C.I. engine.
- Identification of different components of ignition system of S.I. engine.
- Identification of different components of starting system of an engine.
- Identification of different components of transmission system of a car.
- Identification of different components of steering system of a car.
- Identification of different components of suspension system of a car.
- Identification of different components of braking system of a car.

Paper Title: UAMV – 102: WORKSHOP SCIENCE & TECHNOLOGY

Job Role: Automobile Junior Technician

Course Objectives:

- Understand Workshop Tools and Equipment: Introduce students to the various tools and equipment used in workshop settings, including their proper usage, maintenance, and safety protocols.
- Learn Workshop Processes and Techniques: Provide foundational knowledge of essential workshop processes and techniques, such as cutting, welding, machining, and assembly, and how these processes are applied in practical scenarios.
- Develop Skills in Project Planning and Execution: Equip students with the ability to plan, design, and execute workshop projects, emphasizing project management, resource allocation, and quality control.
- Promote Safety and Best Practices: Emphasize the importance of safety procedures and best practices in the workshop environment to ensure safe operation and high quality outcomes.

Course Outcomes:

CO1: Proficiency with Workshop Tools and Equipment: Students will demonstrate the ability to correctly and safely operate a range of workshop tools and equipment, including understanding their functions and maintenance requirements.

CO2: Application of Workshop Techniques: Students will be capable of performing various workshop processes, such as cutting, welding, and machining, effectively and accurately as part of workshop activities.

CO3: Effective Project Planning and Execution: Students will be able to plan and execute workshop projects from start to finish, including designing, managing resources, and ensuring the quality of the final product.

CO4: Commitment to Safety and Best Practices: Students will adhere to safety protocols and best practices in the workshop, minimizing risk and ensuring high standards of workmanship and operational efficiency.

UNIT - I

Engineering materials: Contents : Properties and uses of common Engineering Materials such as Cast Iron, Mild Steel, High Carbon Steel, Alloy Steel, Stainless Steel, Copper, Brass, Tin , Zinc, Gunmetal, Bronze, White metal, Aluminium. Non Metals: Wood, Plastic, Rubber. Importance of safety Precautions in Workshop

UNIT - II

Fitting and Drilling: Contents: Cutting Tools - Chisels, Hacksaws, files, scrapers, Drill Bits, reamers Taps, Dies and Sockets. Striking tools : Hammers, Holding Devices : Vices, Marking Tools & Miscellaneous tools Checking & Measuring Instruments Calipers & Dividers Drilling Machines - Sensitive and Radial Drilling Machines Various Fitting and Drilling operations Sheet Metal Work Contents : Metals used for sheet metal work, sheet metal hand tools - measuring and cutting tools, stakes, Sheet metal operations - Shearing, bending, Drawing, Squeezing Sheet metal joints - Hem & Seam Joints, Fastening Methods - Riveting, soldering, Brazing and spot welding.

UNIT - III

Forging & Welding: Contents: Hand Tools, Heating Devices, Smith Operations, Machine Forging, Forging hammers, Forging press, Welding : Arc welding & Gas Welding Mechanical Working of Metals Contents : Hot working process - Rolling, Piercing, Drawing, Spinning, Extrusion. Cold Working Process: Rolling, Bending, drawing, spinning Extrusion, squeezing, peening, Advantages and limitations of cold working & hot working

UNIT - IV

Lathe & Grinding: Contents: Lathe main parts, simple operations, Grinding - working principle; Grinding wheel materials, Applications of Grinding.

Books Recommended:

- Workshop Technology Vol. I & II - Hazra & Chaudhary, Asian Book Comp. , New Delhi.
- Workshop Technology, Vol. 1, 2 & 3 - Chapman, WAJ, Edward Arnold.
- A Textbook of Workshop Technology, J. K. Gupta

Paper Title: UAMV - 192 WORKSHOP SCIENCE & TECHNOLOGY LAB

List of Experiments: (Based on UAMV – 102)

- Identification of metals and non-metals
- Uses of different types of marking and measuring tools
- Uses of different types of cutting tools
- Different types of fitting jobs
- Methods of making permanent and semi permanent joints
- Hot working process
- Cold working process
- Different types welding and its application
- Different operation in lathe machine
- Different types of grinding machine and its application
- Different types of drill machine and its application

Paper Title: UAMV – 193: ENGINEERING DRAWING

Job Role: Automobile Junior Technician

Course Objectives:

- Understand Fundamental Drawing Techniques: Introduce students to basic engineering drawing techniques, including geometric construction, projection methods, and the use of drawing tools.
- Learn Standard Drawing Conventions: Familiarize students with standard drawing conventions and symbols used in engineering drawings, including line types, dimensions, and tolerances.
- Develop Skills in 2D and 3D Visualization: Equip students with the ability to create and interpret both 2D and 3D drawings, understanding how to visualize and represent complex objects and assemblies.
- Apply Drawing Skills to Engineering Problems: Enable students to apply engineering drawing techniques to solve real world engineering problems, including the creation of detailed and accurate technical drawings for various applications.

Course Outcomes:

CO1: Proficiency in Drawing Techniques: Students will demonstrate the ability to apply fundamental drawing techniques accurately, including geometric constructions and projection methods, using appropriate drawing tools.

CO2: Adherence to Drawing Standards: Students will effectively use standard drawing conventions and symbols, ensuring that their drawings are clear, consistent, and in compliance with industry standards.

CO3: Competence in 2D and 3D Visualization: Students will be capable of producing and interpreting detailed 2D and 3D drawings, accurately representing the dimensions, features, and assembly of complex objects.

CO4: Application of Drawing Skills to Engineering Tasks: Students will be able to apply their drawing skills to create precise and functional technical drawings for engineering applications, demonstrating their ability to solve engineering problems through effective documentation.

UNIT - I

Introduction: Scope and objective of the subject, Importance of engineering drawing as a communication medium, Drawing instruments and their uses, Scales: Recommended scales, reduced & enlarged, Sheet sizes: A0, A1, A2, A3, A4, A5. Layout of drawing sheet, sizes of title block and its contents, Simple exercises on the use of drawing instruments.
Lettering and Dimensioning: Types of Lettering, Guide Lines for lettering, Recommended sizes of letters and numbers, Single stroke letters, Dimensioning - rules and systems of dimensioning - dimensioning, a given drawing.

UNIT - II

Geometric Construction: Bisecting a line - perpendiculars - parallel lines - division of a line, Angles - bisection, trisection, Tangent lines touching circles internally and externally, Polygons - Regular polygons - circumscribed and inscribed in, circles. , Conic sections - Definitions of focus, directrix, eccentricity, (i) Construction of Ellipse by Concentric circles method, (ii) Construction of parabola by rectangular method, (iii) Construction of Hyperbola when given the position of point, from X - axis and Y - axis.

UNIT - III

Orthographic Projection: Definition - Planes of Projection - Four quadrants - Reference line. , First angle projection - Third angle projection, Projections of points, Projections of straight lines, Projections of planes, Projections of solids, Conversion of pictorial views into orthographic views,

UNIT - IV

Isometric Projection: Definition - Isometric axes, lines and planes, Isometric Scale - Isometric view, Drawing of isometric views of plane figures, Drawing of isometric views of prisms and pyramids, Drawing of isometric view of cylinders and cones.
Sections of Solids: Need for drawing sectional views - section planes - true shape of a section, Sections of prisms and pyramids, Sections of cones and cylinders.

Books Recommended:

- Engineering Graphics & Design, Pradeep Jain & A.P. Gautam, Khanna Publishing House (AICTE Recommended Textbook)
- Engineering Drawing: MB Shah and BC Rana, Pearsons
- Engineering Graphics and Drafting: P. S. Gill, S. K. Kataria and Sons.
- A Text Book of Engineering Drawing: RK Dhawan, S Chand & Company
- Engineering Drawing Plane and Solid Geometry : N. D. Bhatt, Charotar Publishing House.

Paper Title: UGEN – 182: COMPUTER FUNDAMENTALS & IT

Course Objectives:

- To introduce students to the fundamental concepts of computers and information technology. This includes understanding computer hardware, software, and their interconnections.
- To develop basic computer skills: Students will learn to operate computer systems, use productivity software, and access information resources effectively.
- To foster digital literacy: Students will be equipped with the knowledge and skills to use computers and information technology responsibly and ethically.
- To prepare students for further studies: This course will lay the foundation for advanced computer courses and IT-related fields.

Course Outcomes:

CO1: Demonstrate basic computer hardware knowledge: Students will be able to identify and describe the components of a computer system and their functions.
CO2: Utilize computer software effectively: Students will be proficient in using operating systems, word processors, spreadsheets, and presentation software.
CO3: Access and utilize information resources: Students will be able to search for, evaluate, and use information from various digital sources.
CO4: Apply digital literacy skills: Students will demonstrate responsible and ethical use of computers and information technology.

UNIT - I

KNOWING COMPUTER: Introduction, Objectives, Basic Applications of Computer, Components of Computer System: Central Processing Unit, Keyboard, mouse and VDU, Other Input devices, Other Output devices, Computer Memory. Concept of Hardware and Software: Hardware, Software: Application Software, Systems software. Concept of computing, data and information. Bringing computer to life: Connecting keyboard, mouse, monitor and printer to CPU, Checking power supply.

UNIT - II

OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM: Introduction, Objectives, Basics of Operating System: Operating system, Basics of popular operating system (LINUX, WINDOWS). The User Interface: Task Bar, Icons, Menu, Running an Application. Operating System Simple Setting: Changing System Date And Time, Changing Display Properties, To Add Or Remove A Windows Component, Changing Mouse Properties, Adding and removing Printers. File and Directory Management: Creating and renaming of files and directories, Common utilities.

UNIT - III

INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS: Introduction, Objectives. Basic of Computer Networks: Local Area Network (LAN), Wide Area Network (WAN). Internet: Concept of Internet, Applications of Internet, Connecting to the Internet, Troubleshooting, World Wide Web (WWW), Web Browsing Software, Popular Web Browsing Software. Search Engines: Popular Search Engines / Search for content, Accessing Web Browser, Using Favorites Folder, Downloading Web Pages, Printing Web Pages. Understanding URL, Surfing the web: Using e - governance website.

UNIT - IV

COMMUNICATIONS AND COLLABORATION: Introduction, Objectives, Basics of E - mail: What is an Electronic Mail, Email Addressing, Using E - mails: Opening Email account, Mailbox: Inbox and Outbox, Creating and Sending a new E - mail, Replying to an E - mail message, Forwarding an E - mail message, Sorting and Searching emails. Introduction to MS - Office: MS - Word, MS - Excel, MS - Power Point.

Books Recommended:

- Computer Fundamentals, R.S. Salaria, Khanna Publishing House (AICTE Recommended Textbook – 2018)
- Handbook of Computer Fundamentals, N.S. Gill, Khanna Publishing House (AICTE Recommended Textbook – 2018)
- Fundamentals of Computers, V. Rajaraman, PHI Publication
- Computer Fundamentals, P. K. Sinha, BPB Publication
- Introduction to Computers with MS - Office 2007, Leon, TMH Publication

Paper Title: UAMV – 201: URBAN TRANSPORTATION REQUIRMENT & PLANNING

Job Role: Automobile Junior Technician

Course Objectives:

- Understand Urban Transportation Needs: Provide students with a comprehensive understanding of the various transportation needs and challenges in urban areas, including demand forecasting, traffic patterns, and user requirements.
- Explore Transportation Planning Processes: Introduce students to the key processes involved in urban transportation planning, including data collection, analysis, and the development of transportation models and plans.
- Analyze Transportation Systems and Infrastructure: Equip students with the skills to analyze existing transportation systems and infrastructure, assessing their effectiveness, efficiency, and impact on urban mobility and development.
- Develop Sustainable Transportation Solutions: Encourage students to design and propose sustainable transportation solutions that address urban mobility challenges while considering environmental, social, and economic factors.

Course Outcomes:

CO1: Assessment of Urban Transportation Needs: Students will be able to identify and assess the transportation needs and challenges in urban environments, using techniques for demand forecasting and traffic analysis.

CO2: Application of Planning Processes: Students will demonstrate proficiency in applying urban transportation planning processes, including data collection, analysis, and model development to create effective transportation plans.

CO3: Evaluation of Transportation Systems: Students will be capable of analyzing and evaluating existing transportation systems and infrastructure, identifying strengths, weaknesses, and areas for improvement.

CO4: Design of Sustainable Transportation Solutions: Students will be able to design and propose innovative and sustainable transportation solutions that effectively address urban mobility issues while promoting environmental and social sustainability.

UNIT - I

Introduction & Urban Transportation System Planning: Role of transportation in urban development, Transportation problems in urban areas, Purpose of transportation planning, Transportation planning process and factors affecting it, Travel demand and factors affecting it, Urban transport forecasting.

UNIT - II

Transportation Plan Preparation: Definitions: corridor, corridor traffic forecasting, corridor traffic study, count, segment, point, segment capacity, screen line, Corridor identification, Mass transit system, Urban mass rapid transit system, Rail based transit – Metro, Light rail transit system (LRT), Mono rail, Sky rail, Road based transit – Bus rapid transit system (BRTS), Electric trolley bus, commuter Bus / City Bus.

UNIT - III

Traffic Management and Control: Traffic Management measures; Arterial Management; Traffic Signs - principles, types and design considerations, road markings; Traffic Signals - types, optimal cycle length and signal settings, warrants; Regulation of Traffic - speed regulation, regulation of vehicle, parking regulations.

UNIT - IV

Transport and Environment: Traffic noise - factors affecting noise, abatement measures, standards; air pollution - factors affecting air pollution levels, abatement measures, standards; Traffic Safety- accident reporting and recording systems, factors affecting road safety; Transport Planning for Target groups - Children, adults, handicapped and women; Norms and Guidelines for highway landscape.

Books Recommended:

- Kadiyali, L. R., "Transportation Engineering", Khanna Book Publishing Company, New Delhi (ISBN: 978-93-82609-858)
- Hutchison, B. G., "Introduction to Transportation Engineering and Planning", Tata McGraw-Hill Pvt. Ltd.
- Morlok, Edward K., "Introduction to Transportation Engineering and Planning", Tata McGraw-Hill Pvt. Ltd.
- Vuchic, Vukan R., "Urban Public Transit System and Technology", PHI Learning, New Delhi
- Dickey, John W., "Metropolitan Transportation Planning", Tata McGraw-Hill Pvt. Ltd Prabhu T. J, "Mechanics of Solids", Private Publication, 2002.

Paper Title: **UAMV – 281 PRACTICE SESSION ON URBAN TRANSPORTATION REQUIRMENT & PLANNING**

Planning for Practical session: (Based on UAMV – 201)

- Preparation of project work on assigned topics
- PPT presentation on the recent transport system and management
- Selected case studies
- Road safety week observation
- Model making on traffic signaling system

Paper Title: UAMV – 202: BASIC ELECTRICAL & ELECTRONICS

Job Role: Automobile Junior Technician

Course Objectives:

- Understand Electrical Principles: Provide students with a foundational understanding of basic electrical principles, including Ohm's Law, Kirchhoff's Laws, and fundamental circuit theory.
- Explore Electronic Components and Circuits: Introduce students to common electronic components (resistors, capacitors, diodes, transistors) and basic electronic circuits, including their functions and applications.
- Develop Circuit Design and Analysis Skills: Equip students with the skills needed to design, analyze, and troubleshoot simple electrical and electronic circuits, using both theoretical methods and practical tools.
- Learn Measurement and Testing Techniques: Teach students how to use electrical measurement and testing instruments, such as multimeters, oscilloscopes, and signal generators, to measure and analyze electrical quantities and circuit behavior.

Course Outcomes:

CO1: Proficiency in Electrical Principles: Students will be able to apply basic electrical principles, such as Ohm's Law and Kirchhoff's Laws, to solve problems related to electrical circuits and systems.

CO2: Understanding of Electronic Components and Circuits: Students will demonstrate knowledge of common electronic components and their functions, as well as the ability to construct and analyze basic electronic circuits.

CO3: Competence in Circuit Design and Troubleshooting: Students will be capable of designing, analyzing, and troubleshooting simple electrical and electronic circuits, applying theoretical concepts to practical scenarios.

CO4: Skilled Use of Measurement Instruments: Students will effectively use measurement and testing instruments to evaluate electrical quantities and circuit performance, ensuring accurate measurements and analysis.

UNIT - I

Fundamentals of DC & AC Circuits: Introduction to DC and AC circuits, Active and passive two terminal elements, Ohms law, Voltage-Current relations for resistor, inductor, capacitor , Kirchhoff's laws, Mesh analysis, Nodal analysis, Ideal sources – equivalent resistor, current division, voltage division. Sinusoids, Generation of AC, Average and RMS values, Form and peak factors, concept of phase or representation, Introduction to three phase systems - types of connections, relationship between line and phase values. Introduction to magnetic circuits-Simple magnetic circuits-Faraday's laws, induced emfs and inductances.

UNIT - II

Electronic Components & Semiconductor Devices: Resistors, capacitors & inductors (properties, common types, I-V relationship and uses), Overview of Semiconductors - basic principle, operation and characteristics of PN diode, zener diode, BJT, JFET, optoelectronic devices (LDR, photodiode, phototransistor, solar cell)

UNIT - III

Transducers & Digital Electronics: Instrumentation – general aspects, classification of transducers, basic requirements of transducers, passive transducers - strain gauge, thermistor, Hall-Effect transducer, LVDT, and active transducers – piezoelectric and thermocouple.

UNIT - IV

Number systems: binary codes - logic gates - Boolean algebra, laws & theorems - simplification of Boolean expression - implementation of Boolean expressions using logic gates - standard forms of Boolean expression.

Books Recommended:

- "Electrical Engineering Practice Laboratory Manual". Subhransu Sekhar Dash & K.Vijayakumar, Vijay Nicole Imprints Private Ltd
- "A Primer on engineering practices Laboratory", Jeyachandran K, Natarajan S & Balasubramanian S, Anuradha Publications.
- "Engineering practices Laboratory manual", Jeyapoovan T, Saravanapandian M & Pranitha S, Vikas Publishing House Pvt., Ltd.
- Basic Electrical Engineering, Ritu Sahdev, Khanna Publishing House, New Delhi
- Basic Electronics, S. Biswas, Khanna Publishing House, New Delhi

Paper Title: UAMV – 291 BASIC ELECTRICAL & ELECTRONICS LAB

List of Experiments: (Based on UAMV – 202)

- Measurement of electrical quantities (like voltage, current, power, power factor in RLC circuits)
- Testing of the following popular components:
    - Resistor
    - Potential meter
    - Inductor (Only continents)
    - Capacitor
    - Diode
    - BJT
    - LED
    - SCR
    - Few digital ICs and analog ICS.
- Techniques of Soldering.
- Familiarization of the following equipment.
- Multi-meter:- voltage, current, resistance measurement.
- Regulated Power Supply: - Set up for certain output voltage and measure it with multimeter.
- Signal generator and CRO: - check the signal generator frequencies and amplifier with CRO.
- V.I. Characteristics of the following components:- a) Rectifier diode b).Zener Diode
- 555 application.

Paper Title: UAMV – 203: PETROL ENGINE

Job Role: Automobile Junior Technician

Course Objectives:

- Understand the Fundamentals of Petrol Engines: Provide students with a comprehensive understanding of the basic principles of petrol engines, including their operating cycles, components, and functions.
- Explore Engine Design and Construction: Introduce students to the design and construction of petrol engines, focusing on key elements such as the engine block, cylinder head, crankshaft, camshaft, and valve mechanisms.
- Analyze Engine Performance and Efficiency: Equip students with the skills to analyze petrol engine performance, including power output, fuel efficiency, emissions, and operational characteristics.
- Develop Skills in Engine Maintenance and Troubleshooting: Teach students practical skills for the maintenance, servicing, and troubleshooting of petrol engines, including common issues and repair techniques.

Course Outcomes:

CO1: Proficiency in Petrol Engine Fundamentals: Students will demonstrate a thorough understanding of the basic principles of petrol engines, including the working of the four-stroke and two-stroke cycles and the role of key engine components.

CO2: Knowledge of Engine Design and Construction: Students will be able to describe the design and construction of petrol engines, identifying major components and their functions, and understanding how they contribute to engine operation.

CO3: Ability to Analyze Engine Performance: Students will be capable of evaluating petrol engine performance metrics, such as power, torque, fuel efficiency, and emissions, and using this data to assess engine operation and identify potential improvements.

CO4: Skills in Engine Maintenance and Troubleshooting: Students will possess practical skills in maintaining, servicing, and troubleshooting petrol engines, applying knowledge to diagnose and repair common engine issues effectively.

UNIT - I

ENGINE CONSTRUCTION AND OPERATION: Constructional details of four stroke petrol engine, working principle, air standard Otto cycle, actual indicator diagram, two stroke engine construction and operation, comparison of four stroke and two stroke engine operation, firing order and its significance. Port Timing, Valve Timing of petrol engines.

UNIT - II

SI ENGINE FUEL SYSTEM: Carburettor working principle, requirements of an automotive carburettor, starting, idling, acceleration and normal circuits of carburettors. Compensation, maximum power devices, constant choke and constant vacuum carburettors, fuel feed systems; mechanical and electrical fuel feed pumps. Petrol injection, MPFI.

UNIT - III

IGNITION SYSTEM: Types and working of battery coil and magneto ignition systems, relative merits and demerits, centrifugal and vacuum advance mechanisms. Types and construction of spark plugs, electronic ignition systems.

UNIT - IV

COOLING AND LUBRICATION SYSTEM: Need for cooling system, Types of cooling system: air cooling system, liquid cooling system, forced circulation system, pressure cooling system. Lubrication system; mist, wet sump lubrication system, properties of lubricants.

COMBUSTION AND COMBUSTION CHAMBERS: Combustion in SI engine; stages of combustion, flame propagation, rate of pressure rise, abnormal combustion, detonation, effect of engine variables on knock, knock rating. Combustion chambers; different types, factors controlling combustion chamber design.

Books Recommended:

- Ganesan. V, "Internal Combustion Engines", Tata McGraw - Hill Publishing Co. , New Delhi, 2003
- Automotive Engines, S. Srinivasan
- Babu, A.K., Automobile Engines, Khanna Publishing House (AICTE Recommended Textbook 2018)

Paper Title: UAMV – 292 PETROL ENGINE LAB

List of Experiments: (Based on UAMV – 203)

- Construction of cylinder, piston, connecting rod, crankshaft and their relative movement
- Operation of two stroke and four stroke petrol engine
- Difference between four stroke and two stroke S.I. engine
- Valve timing if S.I. engine
- Principle of operation of simple carburetor
- Fuel circuit of MPFI (Petrol) engine
- Ignition system
- Servicing of spark plug
- Components of cooling system
- Purpose of lubrication system
- Purpose of oil pump for lubrication system
- Identification of combustion chamber

Paper Title: UGEN – 281: SOFT SKILL & PERSONALITY DEVELOPMENT

Course Objectives:

- Enhance interpersonal communication: Develop students' ability to communicate effectively with diverse audiences, both verbally and non-verbally.
- Foster personal and professional development: Equip students with the necessary skills to build self-confidence, time management, and leadership qualities.
- Improve critical thinking and problem-solving: Enhance students' ability to analyze complex situations, make informed decisions, and find effective solutions.
- Develop teamwork and collaboration: Cultivate students' ability to work effectively in groups, share responsibilities, and achieve common goals.

Course Outcomes:

CO1: Effective communication: Students will be able to communicate clearly, concisely, and persuasively in various settings.
CO2: Personal and professional growth: Students will demonstrate improved self-awareness, time management, and leadership skills.
CO3: Critical thinking and problem-solving: Students will be able to analyze problems, generate solutions, and make informed decisions.
CO4: Teamwork and collaboration: Students will effectively collaborate with others to achieve shared objectives.

UNIT - I

Listening Skills: Barriers to listening; effective listening skills; feedback skills. Attending telephone calls; note taking. Activities: Listening exercises - Listening to conversation, News and TV reports. Taking notes on a speech / lecture.

UNIT - II

Speaking and Conversational Skills: Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics. The study of sounds of English, stress and intonation. Situation based Conversation in English.

UNIT - III

Essentials of Spoken English: Activities, Making conversation and taking turns, Oral description or explanation of a common object, situation or concept, Giving interviews.

UNIT - IV

Oral Presentation with / without audio visual aids. Group Discussion . Listening to any recorded or live material and asking oral questions for listening comprehension.

UNIT - V

Classroom technique to improve the soft skills, Surprise writing on current issues, General grooming sessions to face the interview, Group discussions, Motivational classes to improve communication and confidence power

Books Recommended:

- Soft skills Training - A workbook to develop skills for employment by Fredrick H. Wentz
- Personality Development and Soft skills , Oxford University Press by Barun K. Mitra

Paper Title: UGEN – 282: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING

Course Objectives:

- Understand the Business Environment: Provide students with an understanding of the external and internal factors that influence business operations, including economic, social, technological, and regulatory environments.
- Analyze Sales Strategies and Techniques: Equip students with the skills to analyze and develop effective sales strategies and techniques, focusing on customer acquisition, retention, and sales performance metrics.
- Explore Marketing Principles and Practices: Introduce students to fundamental marketing principles and practices, including market research, segmentation, targeting, positioning, and the development of marketing strategies.
- Integrate Sales and Marketing Analysis: Teach students how to integrate sales and marketing analysis to formulate comprehensive business strategies that align with environmental factors and drive business growth.

Course Outcomes:

CO1: Proficiency in Analyzing the Business Environment: Students will be able to evaluate the external and internal factors impacting a business, including economic trends, technological advancements, and regulatory changes, and their effects on business strategies.

CO2: Development of Effective Sales Strategies: Students will demonstrate the ability to create and implement effective sales strategies and techniques, using data driven insights to enhance customer acquisition and retention.

CO3: Application of Marketing Principles: Students will apply fundamental marketing principles to develop and execute marketing strategies, including market research, segmentation, and positioning, to address market needs and opportunities.

CO4: Integration of Sales and Marketing for Business Success: Students will be capable of integrating sales and marketing analyses to develop cohesive business strategies that respond to environmental factors and drive business performance and growth.

UNIT - I

Business Environment - Introduction, Concept of Business, Levels of the Business Environment, Understanding the Environment, Economic Environment of Business, The Global Economic Environment, Economic Policies, Business and Economic Policies, Socio Cultural Environment, Business and Society, Business and Culture , Indian Business Culture, Culture and Organizational Behavior. Introduction to Political Environment, Political Environment and the Economic system, Types of Political Systems, Indian Constitution and Business, Changing Profile of Indian Economy , Business Risks Posed by the Indian Political System, Economic Systems, Financial Environment: Introduction, An Overview of the Financial System, Components of FinancialSystem, Financial Institutions and their Roles, Financial Institutions in India, Role of Foreign Direct Investment

UNIT - II

Introduction to Legal Environment, Laws Impacting Industry in India, Intellectual Property Rights, Major Regulations Pertaining to Business, Regulatory Role of Government, Promotional Role of Government, Participatory Role of Government, Conciliatory and Judicial Role of Government , Impact of India's Industrial Policy on Economic Reforms, New Economic Policy, Globalization. India, WTO and Trading Blocs, Levels of Economic Integration/Trading Blocs, Effects of Economic Integration, Major Regional Trading Blocs, Commodity Agreement, World Trade Organization, WTO and India, Corporate Social Responsibility: Introduction, Meaning and Definition, Need for social responsibility of business, Social responsibility of business towards different groups, Barriers to social responsibility, Social responsibility of business in India, Public, Private, Joint and Cooperative Sectors

UNIT – III

Traditional and Modern Concepts of Marketing; Selling vs. Marketing; Marketing mix; Marketing Environment. Market Segmentation & its implication. Concept of Product, Product Planning and Development; Packaging: Role and Functions; Brand name and Trade mark; Product Life Cycle Concept; Distributions Channels and Physical Distribution. Price: Importance of Price in the Marketing Mix; Factors affecting Price of a Product/Service; Discounts and Rebates. Methods of Promotion; Advertising Media; Characteristics of an effective Advertisement

UNIT – IV

Salesmanship and Qualities of Salesman; Product knowledge; Customer knowledge: Buying Motives and Selling Points. Scientific Selling; Approach and Presentation: Methods of Approaching a Customer; Presentation Process and Styles; Presentation planning. Objection Handling: Types of objections; Handling customer objections. Closing Sales and Follow up: Methods of closing sale; Executing sales order; Follow-up; Sales Promotion Schemes: Sampling; Coupon; Price Off; Premium Plan; Consumer Contests and Sweeps Takes; POP Displays; Demonstration; Trade Fairs and Exhibitions; Sales Promotion Techniques and Sales Force.

UNIT – V

Study of international organization (WTO, WORLD BANK, IMF, AMA), Case studies on the recent Business Environment, Marketing, & Sales Promotion, PPT presentation on selected issues, Survey to collect the samples for project work

Books Recommended:

- Business Environment; By T. R. Jain, Mukesh Trehan, Ranju Trehan, VK Global Publications.
- Business Environment; By Vishwajeet Prasad, Gyan Publishing House.
- Business Environment; By Saleem, Pearson Education India.
- BUSINESS ENVIRONMENT; By VEENA KESHAV PAILWAR, PHI Learning Pvt. Ltd.
- Business Environment, by Suresh Bedi, Excel Books
- BUSINESS ENVIRONMENT: INDIAN AND GLOBAL PERSPECTIVE; FAISAL AHMED, M. ABSAR ALAMM, PHI Learning Pvt. Ltd.
- Principles of Management, Premvir Kapoor, Khanna Publishing House
- PRINCIPLES OF MARKETING; Kotlar Philip and Armstrong Gary, Pearson Education
- MARKETING MANAGEMENT; Ramaswamy, V.S. and S. Namakumari: Macmillian
- SALES MANAGEMENT; Condiff, Still and Govani et.al: Prentice Hall of India
- SALES MANAGEMENT; Text; Cases & Readings: Vaccaro J.P: Prentice Hall of India
- ADVERTISING & SALES PROMOTION; Kazmi & Batra: Excel Books