

B. VOC

In

AUTOMOBILE SERVICING TECHNOLOGY
(UGC)

Program Outcomes:

- Diagnose and **repair** all major **vehicle** systems.
- Document **repairs** of **vehicles** accurately and descriptive of concern, cause, and correction.
- Effectively locate and utilize **technical** information required for **vehicle repairs**.
- Work safely and responsibly within all shop standards and environmental guidelines.

Course Relevance:

The auto servicing market, currently sticks at Rs. 20, 000 crore, is expected to be worth Rs. 33, 000 - 34, 000 crore by 2020. Indian automobile industry is the largest in the world and accounts for more than 7% of the country's GDP. The Govt. of India has taken several initiatives and the increasing presence of major automobile players in the Indian market is expected to make Indian car market a world leader by 2020. Resultantly, the car servicing business is growing faster to meet the increasing demand from this large car population in the country.

The market research data states that only one - third of the cars go back to dealer workshops post warranty and rest opt for local multi - brand garages, which can provide reliable and cost - effective service with closer home advantage. To cater to this ever increasing demand, the Multi - Brand car servicing stations, providing cost - effective yet high quality repairs, is the future of car servicing industry in India.

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 2018-2019)
Year - 1 - Diploma (SEMESTER - I)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 101 ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS	Generic	Theory	10	40	-	-	1	1	-
UGEN - 102 COMPUTER FUNDAMENTALS & IT	Generic	Theory	10	40	-	-	1	1	-
UAMV - 103 FUNDAMENTALS OF AUTOOBILE ENGINEERING	Skill	Theory	10	40	-	-	1	1	-
UAMV - 104 WORKSHOP SCIENCE & TECHNOLOGY	Skill	Theory	10	40	-	-	1	1	-
UGEN – 191 COMPUTER FUNDAMENTALS & IT LAB	Generic	Practical	-	-	10	40	-	-	2
UAMV - 192 FUNDAMENTALS OF AUTOOBILE ENGINEERING LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 193 WORKSHOP SCIENCE & TECHNOLOGY LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 194 ENGINEERING DRAWING	Skill	Practical	-	-	40	60	-	-	4
UGEN – 181 ENGLISH LANGUAGE LAB	Generic	Sessional	-	-	-	50	-	-	2
<p>All Generic Components common to all B. Voc. courses. Industrial Training of 3 - 4 weeks of 6 credits in each year followed by report writing and Viva Voce. These credits will be evaluated in semester 6</p>									

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Year - 1 - Diploma (SEMESTER - II)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 201 SOFT SKILL & PERSONALITY DEVELOPMENT	Generic	Theory	10	40	-	-	1	1	-
UGEN - 202 BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	Generic	Theory	10	40	-	-	1	1	-
UAMV - 203 URBAN TRANSPORTATION REQUIRMENT & PLANNING	Skill	Theory	10	40	-	-	1	1	-
UAMV - 204 BASIC ELECTRICAL & ELECTRONICS	Skill	Theory	10	40	-	-	1	1	-
UAMV - 205 PETROL ENGINE	Skill	Theory	10	40	-	-	1	1	-
UAMV - 291 BASIC ELECTRICAL & ELECTRONICS LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 292 PETROL ENGINE LAB	Skill	Practical	-	-	10	40	-	-	2
UGEN - 281 SOFT SKILL & PERSONALITY DEVELOPMENT LAB	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 282 PRACTICE SESSION ON BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	Generic	Sessional	-	-	-	50	-	-	2
UAMV - 283 PRACTICE SESSION ON URBAN TRANSPORTATION REQUIRMENT & PLANNING	Skill	Sessional	-	-	-	50	-	-	2
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Year - 2 - Advanced Diploma (SEMESTER - III)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 301 VALUE EDUCATION & HUMAN RIGHTS	Generic	Theory	10	40	-	-	1	1	-
UGEN - 302 BASIC ACCOUNTING	Generic	Theory	10	40	-	-	1	1	-
UAMV - 303 CAD	Skill	Theory	10	40	-	-	1	1	-
UAMV - 304 DIESEL ENGINE	Skill	Theory	10	40	-	-	1	1	-
UAMV - 305 AUTOMOBILE BODY & CHASSIS ENGINEERING	Skill	Theory	10	40	-	-	1	1	-
UAMV - 391 CAD LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 392 DIESEL ENGINE LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 393 AUTOMOBILE BODY & CHASSIS ENGINEERING LAB	Skill	Practical	-	-	10	40	-	-	2
UGEN - 381 PRACTICE SESSION ON VALUE EDUCATION & HUMAN RIGHTS	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 382 PRACTICE SESSION ON BASIC ACCOUNTING	Generic	Sessional	-	-	-	50	-	-	2
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Year - 2 - Advanced Diploma (SEMESTER - IV)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 401 ENVIRONMENTAL STUDIES	Generic	Theory	10	40	-	-	1	1	-
UGEN - 402 QUALITY MANAGEMENT	Generic	Theory	10	40	-	-	1	1	-
UAMV - 403 VEHICLE PERFORMANCE AND TESTING	Skill	Theory	10	40	-	-	1	1	-
UAMV - 404 AUTOMOTIVE SAFETY	Skill	Theory	10	40	-	-	1	1	-
AMV - 405 AUTO ELECTRICAL SYSTEMS & TRANSMISSION	Skill	Theory	10	40	-	-	1	1	-
UAMV - 491 VEHICLE PERFORMANCE AND TESTING LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 492 AUTOMOTIVE SAFETY LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 493 AUTO ELECTRICAL SYSTEMS & TRANSMISSION LAB	Skill	Practical	-	-	10	40	-	-	2
UGEN - 481 PRACTICE SESSION ON ENVIRONMENTAL STUDIES	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 482 PRACTICE SESSION ON QUALITY MANAGEMENT	Generic	Sessional	-	-	-	50	-	-	2
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Year - 3 - Degree (SEMESTER - V)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 501 INDIAN ECONOMY & SOCIAL CHANGES	Generic	Theory	10	40	-	-	1	1	-
UGEN - 502 RESEARCH METHODOLOGY	Generic	Theory	10	40	-	-	1	1	-
UAMV - 503 TWO AND THREE WHEELERS	Skill	Theory	10	40	-	-	1	1	-
UAMV - 504 AUTOMOTIVE AIR CONDITIONING	Skill	Theory	10	40	-	-	1	1	-
UAMV - 505 MOTOR VEHICLE ACT & POLLUTION CONTROL	Skill	Theory	10	40	-	-	1	1	-
UAMV - 591 TWO AND THREE WHEELERS LAB	Skill	Practical	-	-	10	40	-	-	2
UAMV - 592 AUTOMOTIVE AIR CONDITIONING LAB	Skill	Practical	-	-	10	40	-	-	2
UGEN - 581 PRACTICE SESSION ON INDIAN ECONOMY & SOCIAL CHANGES	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 582 PRACTICE SESSION ON RESEARCH METHODOLOGY	Generic	Sessional	-	-	-	50	-	-	2
UAMV - 583 PRACTICE SESSION ON MOTOR VEHICLE ACT & POLLUTION CONTROL	Skill	Sessional	-	-	-	50	-	-	2
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Year - 3 - Degree (SEMESTER - VI)

Course	Component	Theory / Practical / Sessional	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical / Sessional)	Credit		
							L	T	P
UGEN - 601 GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Theory	10	40	-	-	1	1	-
UGEN - 602 ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Theory	10	40	-	-	1	1	-
UGEN - 681 PRACTICE SESSION ON GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Sessional	-	-	-	50	-	-	2
UGEN - 682 PRACTICE SESSION ON ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Sessional	-	-	-	50	-	-	2
UAMV - 683 INDUSTRIAL TRAINING	Skill	Sessional	-	-	-	300	-	-	12
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Year - 1 Diploma (SEMESTER - I)

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

Objective: The objective of this paper is to familiarize the students with the importance of Communication and its associated components in the hard core corporate sector.

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

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Paper Title: UGEN – 102: COMPUTER FUNDAMENTALS & IT

Objectives: The objective of this course is to familiarize students with Fundamentals of Computer and IT applications. It enables the student to get practical exposure towards MS - Office tools.

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: UGEN – 191 COMPUTER FUNDAMENTALS & IT LAB

List of Experiments: (Based on UGEN – 102)

- Different components of Taskbar
- Create Desktop icons
- Create Folder and Files on Desktop
- Run Application such as Notepad, MS Paint
- Change Mouse properties in Windows
- Connecting to the Internet
- Applying browsers software such as chrome, Internet Explorer
- Applying software download
- Create E-mail ID in a mail server
- Sending E-mail and working with Inbox
- Create Bio data in word
- Formatting text in Word
- Create excel database, apply auto sum
- Create presentation file with multiple slides
- Apply slide transition

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Paper Title: UAMV – 103: FUNDAMENTALS OF AUTOMOBILE ENGINEERING

Job Role: Automobile Junior Technician

Objectives: The course provides an in depth knowledge on the various dimensions of automobile engineering in addition to a few hand on training programs.

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 stroke 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 - 192 FUNDAMENTALS OF AUTOOBILE ENGINEERING LAB

List of Experiments: (Based on UAMV – 103)

- 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.

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- 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 – 104: WORKSHOP SCIENCE & TECHNOLOGY

Job Role: Automobile Junior Technician

Objectives: The course encapsulates the fundamentals of the subject, apart from the hardcore properties of the same to the students.

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 - 193 WORKSHOP SCIENCE & TECHNOLOGY LAB

List of Experiments: (Based on UAMV – 104)

- 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

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Paper Title: UAMV – 194: ENGINEERING DRAWING

Job Role: Automobile Junior Technician

Objectives: The course aims to sum up the different angles involved in the pattern of engineering drawing.

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.

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Paper Title: UGEN – 201: SOFT SKILL & PERSONALITY DEVELOPMENT

Objective: On completion of the course, the students will be able to listen to lectures, public announcements, news on TV, radio and engage in telephonic conversation to communicate effectively and accurately in English used as spoken language for various purposes.

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.

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 - 281 SOFT SKILL & PERSONALITY DEVELOPMENT LAB

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

- 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

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Paper Title: UGEN – 202: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING

Objective: The course will enable the students to understand, assimilate and apply the various dimensions of business and its associated affairs in the socio economic, socio cultural and socio political ambience.

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 Financial System, 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.

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

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Paper Title: UGEN - 282 PRACTICE SESSION ON BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING

Planning for Practical session: (Based on UGEN – 202)

- 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

Paper Title: UAMV – 203: URBAN TRANSPORTATION REQUIREMENT & PLANNING

Job Role: Automobile Junior Technician

Objectives: The objective of this subject is to make the student understand the transportation requirement in the urban areas and to be aware of the basics of planning. The student should have basic knowledge about street, road and highways.

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 – 283 PRACTICE SESSION ON URBAN TRANSPORTATION REQUIREMENT & PLANNING

Planning for Practical session: (Based on UAMV – 203)

- 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

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Paper Title: UAMV – 204: BASIC ELECTRICAL & ELECTRONICS

Job Role: Automobile Junior Technician

Objectives: This subject provides knowledge of different principals of electrical engineering, basic idea of different electronic components, semi conducting devices, transducers and digital electronics used in the industry.

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, Kirchoff'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”, Jeyapooan 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 – 204)

- 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.

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Paper Title: UAMV – 205: PETROL ENGINE

Job Role: Automobile Junior Technician

Objectives: The course aims at sharing of knowledge of the different aspects of petrol engine, ranging from construction and operation to different systems and chambers among the students.

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 – 205)

- 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 of 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

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Year - 2 Advanced Diploma (SEMESTER - III)

Paper Title: UGEN – 301: VALUE EDUCATION & HUMAN RIGHTS

Objective: The course aims to provide a sharp insight into the importance of human values, ethics, morality and above all the full growth of personality to ensure some total development of the human mind.

UNIT – I

Concept of Human Values, Value Education Towards Personal Development, Aim of education and value education; Evolution of value oriented education; Concept of Human values; types of values; Components of value education. Personal Development, Character Formation Towards Positive Personality, Value Education Towards National and Global Development, National and International Values, Social Values, Professional Values , Religious Values, Aesthetic values.

UNIT – II

Impact of Global Development on Ethics and Values, Conflict of cross – cultural influences, mass media, cross – border education, materialistic values, professional challenges and compromise, Modern Challenges of Adolescent Emotions and behavior; Sex and spirituality, Adolescent Emotions.

UNIT – III

Therapeutic Measures – Control of the mind through: Simplified physical exercise, Meditation – Objectives, types, effect on body, mind and soul, Yoga – Objectives, Types, Asanas, Activities; Moralisation of Desires, Neutralisation of Anger, Eradication of Worries, Benefits of Blessings

UNIT – IV

Human Rights – concepts & evolution, Definitions under Indian and International documents, Broad classification of Human Rights and Relevant Constitutional Provisions, Human Rights of Women and Children, Institutions for Implementation, Violations and Redressal.

Books Recommended:

- Value education and human rights, By R. P. Shukla, Sarup & Sons
- Professional Ethics and Human Values, Premvir Kapoor, Khanna Publishing House (AICTE Recommended Textbook)
- Value Education And Education For Human Rights, By V.C. Pandey, Gyan Publishing House.
- Education for Values, Environment and Human Rights, By Y. K. Sharma, Published by Deep and Deep Publications.
- Human Rights: Twenty First Century Challenges, edited by V.N. Viswanathan (ed. By), Gyan Publishing House.
- Education for Values, Environment and Human Rights, By J. C. Aggarwal, Shipra Publications, 2005
- Human Rights Education: A Global Perspective, edited by Hemlata Talesra, Nalini Pancholy, Mangi Lal Nagda, Published by Daya Books.

Paper Title: UGEN - 381 PRACTICE SESSION ON VALUE EDUCATION & HUMAN RIGHTS

Planning for Practical session: (Based on UGEN – 301)

- Motivational classes on values and ethics
- Case studies
- PPT presentation on selected areas

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Paper Title: UGEN – 302: BASIC ACCOUNTING

Objective: The course will surely help the students to gain a comprehensive knowledge on the various areas of finance such as basic concepts, role of accounts, preparation of charts and an overview of the subject at the both domestic and international levels.

UNIT – I

Define the accounting process, Describe the role of accountants, Explain accounting concepts and principles, Discuss the concept of the accounting equation, Use the accounting equation to analyze basic transactions in terms of increases and decreases, Reporting financial information on a balance sheet, Determine how transactions change owner's equity in an accounting equation, Reporting a changed accounting equation on a balance sheet, Analyze transactions using T – accounts and using debits and credits, Use debits and credits to record increase and decreases in accounts, Record journal entries in a 5 – column journal, Define accounting terms related to journalizing transactions, Prove and rule a five – column journal and prove cash

UNIT – II

Prepare a chart of accounts and opening accounts, Post separate amounts from a journal to a general ledger, Post column totals from a journal to a general ledger, Make correcting entries, Reconcile a bank statement and record bank service charges, dishonored checks, and petty cash transactions, Describe and prepare the work sheet, Plan and adjust entries on a work sheet, Extend financial statement information on a work sheet, Find and correct errors on a work sheet, Describe the content and purpose of the three basic financial statements and how they are related.

UNIT – III

Journalize and post adjusting entries, Journalize and post closing entries and prepare a post – closing trial balance. Reinforcement 1B, Describe the nature of merchandising business, Describe and be able to journalize purchases of merchandise for cash, Describe and be able to journalize purchases of merchandise on account and buying of supplies, Describe and be able to journalize cash payments and other transactions, Journalizing sales (compute sales tax) and cash receipts, Describe the concept of subsidiary ledgers, Journalize and post using accounts payable subsidiary ledgers, Journalize and post using accounts receivable subsidiary ledgers

UNIT – IV

Prepare payroll records, Preparing payroll time cards, Calculating employee total earnings, Determining payroll tax withholding, Preparing payroll checks, Record, and journalize the payroll for a merchandising business, Record employer payroll taxes, Reporting, and paying withholding and payroll taxes, Prepare a worksheet for a merchandising business, Analyzing and adjusting the Merchandise Inventory account, Analyzing and adjusting the Supplies account, Analyzing and adjusting the Prepaid Insurance account, Prepare a multiple – step income statement for a merchandising business, Analyzing component percentages of income statements showing net income and net loss, Prepare a distribution of net income and owner's equity statements, Prepare a classified balance sheet

Books Recommended:

- Basic Accounting: The step-by-step course in elementary accountancy, By Nishat Azmat, Andy Lymer, Hachette UK.
- Basic Accounting, By Rajni Sofat, PHI Learning Pvt. Ltd.
- BASIC ACCOUNTING, By SOFAT, RAJNI , HIRO, PREETI, PHI Learning Pvt. Ltd.
- Accounting for Beginners, By Kokab Rahman, Createspace Independent Pub, 2013

Paper Title: UGEN - 382 PRACTICE SESSION ON BASIC ACCOUNTING

Planning for Practical session: (Based on UGEN – 302)

- Assignment on discussed topics
- Case studies analysis

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Paper Title: UAMV – 303: CAD

Job Role: Automobile Senior Technician

Objectives: The course provides a unique blend of theory and practice to make the students aware of the small things before the start their career as an automobile senior technician.

UNIT - I

Start a New Drawing, Name the Drawing Sheet, Set the Drawing Units, Drawing Precision, Drawing Limits, Grid, Snap and Draw the Margin and Title Block as given in Exercise Problems Sheet. Redraw the 2D Figures including dimensions as given in Exercise Problems Sheet using various Fundamental of 2D commands in Draw and Modify Toolbars Redraw the 2D Figures including dimensions as given in Exercise Problems Sheet using various Advance commands in Osnap, Grip, Block, Layers, Attributes, Edit Toolbars

UNIT - II

Draw Front, Top, and Right Side Orthogonal view of each of the objects in given Exercise Problems Sheet using View Port commands Draw 3D Surface Models of the Objects as given in Exercise Problems Sheet, using fundamental of 3D Drawing and Surface commands

UNIT - III

Draw 3D Solid Models of the Objects as given in Exercise Problems Sheet, using fundamental of 3D Drawing and Solid commands Draw 3D Models of different types of Joints, Pulleys and Engine Bearings as given in Exercise Problems Sheet.

UNIT - IV

Draw 3D Models of different types of Engine Piston, Connecting Shafts and Crank Shafts as given in Exercise Problems Sheet. Draw 3D Models of Simple Automobile Assemblies of Gears & Cam Followers as given in Exercise Problems Sheet.

Books Recommended:

- AutoCAD For Dummies, Bill Fane
- Introduction To AutoCAD 2005 2D and 3D Design, Alf Yarwood
- Engineering AutoCAD, Pradeep Jain & A.P. Gautam, Khanna Publishing House
- Engineering Graphics and Design, Pradeep Jain & A.P. Gautam, Khanna Publishing House

Paper Title: UAMV – 391 CAD LAB

List of Experiments: (Based on UAMV – 303)

- Develop the concept of drawing of various dimensions including 2d commands.
- Learn and apply the concept of toolbars redraw the 2d figures using Advanced commands in Osnap, Grip, Block, Layers, Attributes, edit toolbars.
- Develop the concept of Front, Top and Right side Orthogonal view and apply the same using view port commands.
- Learn and apply the concept of 3d drawings, surface commands and 3D solid model modification.
- Learn to draw the 3d models of different types viz. joints, pulleys and engine bearings.
- Learn to draw the 3d models of different types(Piston, Shafts, Automobile Assemblies, Cm Followers)
- Power point Presentation. (Selected topics).
- Paper Presentation. (Selected topics).

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Paper Title: UAMV - 304 - DIESEL ENGINE

Job Role: Automobile Senior Technician

Objectives: The course aims at sharing of knowledge of the different aspects of diesel engine, ranging from basic theory to different systems and chambers among the students.

UNIT - I

BASIC THEORY: Diesel engine construction and operation, two stroke and four stroke diesel dual cycle engines, diesel cycle, fuel - air and actual cycle analysis, diesel fuel, ignition quality, certain number, laboratory tests for diesel fuels, standards and specifications.

UNIT - II

FUEL INJECTION SYSTEM: Requirements, air and solid injection, functions of components, jerk and distributor type pumps common rail system, PTFI system pressure waves, injection lag, unit injector, mechanical and pneumatic governors, fuel injector, types of injection nozzle, nozzle tests, spray characteristics, injection timing, pump calibration.

UNIT - III

AIR MOTION, COMBUSTION AND COMBUSTION CHAMBERS Importance of air motion, swirl, squish and turbulence, swirl ratio, fuel air mixing, stages of combustion, delay period, factors affecting delay period, knock in CI engines. Combustion chamber: design requirements, direct and indirect injection combustion chambers, M type combustion chamber.

UNIT - IV

SUPERCHARGING AND TURBOCHARGING Necessity and limitations, types of supercharging and turbo charging, relative merits, matching of turbocharger, exhaust gas recirculation, charge cooling. **DIESEL ENGINE TESTING AND PERFORMANCE** Automotive and stationary diesel engine testing and related emission standards. Engine performance and emission characteristics, variables affecting engine performance and emission, methods to improve engine performance, heat balance, performance maps.

Books Recommended:

- Ganesan. V “Internal Combustion Engines”, Tata McGraw - Hill Publishing Co. , New Delhi, 2003.
- Modern Diesel Technology 2nd Edition, Sean Bennett.

Paper Title: UAMV – 392 DIESEL ENGINE LAB

List of Experiments: (Based on UAMV – 304)

- Operation of four stroke Diesel Engine.
- Principle of operation of single element, multi elements and distributor type FIP.
- Checking and servicing of different types of injectors
- Principle of operation of different types of Governor unit.
- Fuel injection timing
- Engine overhauling, use of compression pressure testing gauge, checking of engine noise by stethoscope.
- Construction of cylinder head, combustion chamber, shape of piston head.
- Forced induction, Types of force induction, turbolog etc
- Use of EGR. PCV valve, catalytic converter and waste gate valve

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Paper Title: UAMV – 305: AUTOMOBILE BODY & CHASSIS ENGINEERING

Job Role: Automobile Senior Technician

Objectives: This subject aims to help the students acquire a comprehensive knowledge of Chassis, Frame and Body, Steering System, Braking System, Suspension System, Seat, Door and Window mechanism, Painting of automobiles, Automobile Pollution and Legal aspects of motor vehicles.

UNIT - I

Chassis, Frame and Body: Introduction of Chassis frame, Layout of the Chassis and its main components, Functions of the Chassis frame, Types of Chassis frames, Various loads acting on the frame, State the different bodies used in automobiles, Explain the requirements of bodies for various types of vehicles viz. private, commercial etc.

Steering System: Requirement of the vehicle steering System, Types of steering gearboxes, Types of Steering Systems and Power Steering, Steering linkages, Under steering, over steering, & Turning radius, Ackerman's & Davis Steering gear Mechanism, Steering geometry - Caster, Camber, King pin inclination, toe in and toe out, Wheel alignment, Steering defects - wheel wobble and shimmy, List out the type of steering system used in various vehicles.

UNIT - II

Braking System: Explain Functions of brakes, Requirements of automobile brakes, Explain stopping time and stopping distance, Types of Braking systems - Disc and Drum braking system, Construction and working of Mechanical, hydraulic, and air brakes, - Bleeding of brakes in Hydraulic brakes, List out the types of brakes used in various vehicles.

Suspension System: Requirements of a automobile suspension system, Types of suspension system - conventional and Independent, Types of springs - Laminated spring, coil spring, helical spring, Need of Shock absorber - construction and working of different types of shock absorbers, Stabilizer bar and torsion bar, List out the type of suspension system used in various vehicles,

UNIT - III

Seat, Door and Window mechanism: Construction and working of door lock mechanism, Construction and working of manual window regulating mechanism, Construction and working of power window regulating mechanism, Construction and working of seat adjusting mechanism.

UNIT - IV

Painting of automobiles: Constituents of paints, Methods of painting, Painting Procedure, Reasons for failure of paint.

Books Recommended:

- John Doke "Fleet Management", McGraw - Hill Co. 1984.
- Babu, A.K., Automobile Mechanics, Khanna Publishing House, 2018

Paper Title: UAMV – 393 AUTOMOBILE BODY & CHASSIS ENGINEERING LAB

List of Experiments: (Based on UAMV – 305)

- Construction and operating principle of chassis body and frame. Different types of chassis body shape, one box, two box and three box.
- Different components / linkage use in steering system. Working principle and construction of different types of steering gear box and power steering system. Steering geometry caster camber and toe-in adjustment.
- Construction and operation of different types of brake system employed in the automobile. Adjustment of drum and disc brake. Bleeding of hydrolic brake system. Use of ABS, EBD and TCS
- Construction and working principle of various suspension system use in automobile. Construction and operation of leaf spring, coil spring air spring, rubber spring, torsion bar, shockabsorber and stabilizer bar
- Name the various parts of mono construction body. Construction and working principle of door lock mechanism, manual and power window regulator mechanism.

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Year - 2 Advanced Diploma (SEMESTER - IV)

Paper Title: UGEN – 401: ENVIRONMENTAL STUDIES

Objective: Keeping in view the modern status of environment, the course primarily aims at providing various awareness programs required for the welfare of the environment apart from the emphasis on the general and conventional issues surrounding the environment.

UNIT - I

Multidisciplinary nature of environmental studies - Definition, scope and importance, need for public Awareness, Natural Resources: Renewable and non - renewable resources, Natural resources and associated problems, Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles, Ecosystems: Concept, Structure and function of an ecosystem. Producers, consumers and decomposers. Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids.

UNIT - II

Biodiversity and its conservation , Bio - geographically classification of India, Value of biodiversity, Biodiversity at global, National and local levels. India as a mega diversity Nation, Hot - spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man - wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In - situ and Ex - situ conservation of biodiversity.

UNIT - III

Environmental Pollution: Definition , Cause, effects and control measures of : Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management: floods, earthquake, cyclone and landslides . Social Issues and the Environment: From Unsustainable to Sustainable development. Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and Rehabilitation of people; its problems and concerns. Case Studies.

UNIT - IV

Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution)Act. Wildlife Protection Act Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human Population and the Environment. Population growth, variation among nations. Population explosion - Family Welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and Human health. Case Studies.

Books Recommended:

- M.P. Poonia & S.C. Sharma, Environmental Studies, Khanna Publishing House
- Mike Hulme, Climates and Cultures.
- Mark Garrett, Encyclopaedia of Transportation Social Science and Policy.
- Steel, Science An A - to - Z Guide to Issues and Controversies.
- John A Matthews, Encyclopaedia of Environmental Change.
- O.P. Gupta, Elements of Environmental Pollution Control, Khanna Publishing House

Paper Title: UGEN - 481 PRACTICE SESSION ON ENVIRONMENTAL STUDIES

Planning for Practical session: (Based on UGEN – 401)

- Case studies
- Tree plantation program
- PPT presentation on selected areas
- Poster making

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Paper Title: UGEN – 402: QUALITY MANAGEMENT

Objective: This course will help the students to digest the basic features of the subject apart from a handful of theories, laws, hypothesis included in the course, before the students stamp their feet on the corporate sector.

UNIT - I

Introduction to Quality Management, Evolution of Quality Management, Concepts of Product and Service Quality
Dimensions of Quality, Deming's, Juran's, Crosby's Quality Philosophy, Quality Cost

UNIT - II

Introduction to Process Quality, Graphical and statistical techniques for Process Quality Improvement
Graphical tools for data representation, 7 QC tools

UNIT - III

Sampling, sampling distribution, and hypothesis Testing Regression, Control charts, Process capability analysis, Measurement system analysis, Analysis of Variance (ANOVA), Design and Analysis of Experiment (DOE), Acceptance sampling plan, TQM, Leadership, Lean and JIT Quality Philosophy, Benchmarking, Process failure mode and effect analysis(PFMEA), Service Quality, Six sigma for Process Improvement, ISO 9001 and QS 9000
Quality Audit, Quality Circles

UNIT - IV

Quality Improvement, Quality Function Deployment, Robust Design and Taguchi Method, Design Failure Mode & Effect Analysis, Product Reliability Analysis, Six Sigma in Product Development

Books Recommended:

- D. C. Montgomery, Introduction to Statistical Quality Control, John Wiley & Sons, 3rd Edition.
- Mitra A. , Fundamentals of Quality Control and Improvement, PHI, 2nd Ed. , 1998.
- M.P. Poonia & S.C. Sharma, Total Quality Management, Khanna Publishing House, (AICTE Recommended Textbook)
- J Evans and W Linsay, The Management and Control of Quality, 6th Edition, Thomson, 2005
- Besterfield, D H et al. , Total Quality Management, 3rd Edition, Pearson Education, 2008.
- D. C. Montgomery, Design and Analysis of Experiments, John Wiley & Sons, 6th Edition, 2004
- D. C. Montgomery and G C Runger, Applied Statistics and Probability for Engineers, John Wiley & Sons, 4th Edition.

Paper Title: UGEN - 482 PRACTICE SESSION ON QUALITY MANAGEMENT

Planning for Practical session: (Based on UGEN – 402)

- Case studies
- PPT presentation on TQM practices
- Survey and sample collection for project

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Paper Title: UAMV – 403: VEHICLE PERFORMANCE AND TESTING

Job Role: Automobile Senior Technician

Objectives: The course aims to provide a comprehensive knowledge on the different dimensions and their uses and applications in the area of transport management.

UNIT - I

VEHICLE PERFORMANCE PARAMETERS: Vehicle Performance parameters, Fuel economy, acceleration, deceleration, grad ability, top speed, handling, comfort, life durability, EGR systems, and Vehicular systems: Suspension steering, Brakes & carriage unit testing, test procedure, Catalytic converters function & construction, Lambda close loop control system for gasoline vehicles.
DRIVE TRAIN AND TESTING: Vehicular transmission performance: Characteristics and comparison of automotive clutches, Epicyclic transmission, Torque converter, testing of clutch, final drive and differential. Test procedure for gear box noise and shifting force.

UNIT - II

VEHICLE TESTING: Vehicle Testing - Road test, Free acceleration test, Coast down test, Passer by noise test, Wheel alignment and balancing test, Test tracks û proving ground testing, high speed track, pavement track, corrugated track, mud track, steering pad, gradient track, deep wading through shallow water, Laboratory testing û testing on chassis dynamometer transition testing- Euro III onwards, accelerated testing, Virtual testing, Evaporative emission testing, Oil consumption testing

UNIT - III

SAFETY SYSTEMS AND AUXILIARIES: Safety: Motor vehicle safety standards, active safety, passive safety, bio-mechanics Structural safety, energy absorption, ergonomic consideration in safety, Occupants safety systems like seat belts, head restrain, air bags, GPS , roll-over protection system, Electronic stability program. Particulate traps Function & construction.

UNIT - IV

COLLISIONS AND CRASH TESTING: Crash testing: Human testing, Dummies, crashworthiness, pole crash testing, rear crash testing, vehicle to vehicle impact, side impact testing, crash test sensors, sensor mounting, crash test data acquisition ,Braking distance test

NOISE VIBRATION AND EMI: Noise & vibration: Mechanism of noise generation, engine noise & vibration, causes and remedies, road shocks wind noise & measurement, vehicle measurement testing. Automobile testing instrumentation: Sensors types and selection, Instrumentation for functional tests, Battery testing, endurance test, model test and full scale

Books Recommended:

- Automobile Mechanics, A.K. Babu, Khanna Publishing House (AICTE Recommended textbook)
- Wolt, Heinrich Hucho, Aerodynamics of road vehicles
- Bosch, Automotive Handbook
- George Pieters Barbara Pieters, Automotive Vehicle Safety
- Michel Plint Engine Testing Theory and Practice
- Gousha H. M., Engine performance Diagnosis & Tune Up Shop Manual
- J.G .Giles, Vehicle Operation & Performance.
- W. H. Crouse & D. L. Anglin, Motor Vehicle Inspection.
- SAE Transaction Papers 831814/820346/820367/820371/820375
- SAE handbook vol 2 & 3
- Automobile Engineering by Ramlingam
- Automobile engineering by Kripal Singh
- Automotive Mechanics by Josepf Heitner
- ARAI vehicle emission test manual
- Automobile Engineering by Rangawala

Paper Title: UAMV – 491 VEHICLE PERFORMANCE AND TESTING LAB

List of Experiments:(Based on UAMV – 403)

- Engine / vehicle performance, P.V. diagram, mechanical efficiency, volumetric efficiency and losses of fuel economy.

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- Construction and working principle of EGR and catalytic converter. Testing procedure of suspension, brake and steering system.
- Exhaust emission testing, oil consumption testing and road test.
- Construction and operation of automatic clutch epicyclic transmission and torque converter. Testing of clutch, gear box, final drive and differential
- Safety of driver and occupants like seat belt, air bags, GPS, ESP, functions and operations.

Paper Title: UAMV – 404: AUTOMOTIVE SAFETY

Job Role: Automobile Senior Technician

Objectives: The course encapsulates the fundamentals as well as the advanced areas of automobile safety.

UNIT - I

INTRODUCTION: Design of the body for safety, energy equation, engine location, deceleration of vehicle inside passenger compartment, deceleration on impact with stationary and movable obstacle, concept of crumple zone, safety sandwich construction.

SAFETY CONCEPTS: Active safety, driving safety, conditional safety, perceptibility safety, operating safety- passive safety: exterior safety, interior safety, deformation behaviour of vehicle body, and speed and acceleration characteristics of passenger compartment on impact.

UNIT - II

SAFETY EQUIPMENTS: Seat belt, regulations, automatic seat belt tightener system, collapsible steering column, tiltable steering wheel, air bags, electronic system for activating air bags, bumper design for safety.

UNIT - III

COLLISION WARNING AND AVOIDANCE: Collision warning system, causes of rear end collision, frontal object detection, rear vehicle object detection system, object detection system with braking system interactions.

UNIT - IV

COMFORT AND CONVENIENCE SYSTEM: Steering and mirror adjustment, central locking system, Garage door opening system, tyre pressure control system, rain sensor system, environment information system.

Books Recommended:

- Bosch - "Automotive Handbook" - 5th edition - SAE publication - 2000.
- J. Powloski - "Vehicle Body Engineering" - Business books limited, London
- Ronald. K. Jurgen - "Automotive Electronics Handbook" - Second edition- McGraw-Hill
- A.K. Babu, Automobile Electricals and Electronics, Khanna Publishing House, New Delhi

Paper Title: UAMV – 492 AUTOMOTIVE SAFETY LAB

List of Experiments: (Based on UAMV – 404)

- Aerodynamic body shape advantages
- Use of seat belt, automatic seat belt adjustment system
- Collapsible steering column servicing. Adjustment of steering wheel
- Operation of front and rear vehicle object detection system
- Rear view mirror adjustment
- Operation of central locking system tyre pressure control system, Dicky opening system and rain sensor system
- Servicing of door hinged and door lock.

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Paper Title: UAMV – 405: AUTO ELECTRICAL SYSTEMS & TRANSMISSION

Job Role: Automobile Senior Technician

Objectives: This subject provides a detailed knowledge about Clutch, Gear Box, Front and Rear Axles, Wheels and Tyres, Ignition System, Charging System, Starting System, Lighting, Horn and Wipers, Battery.

UNIT - I

Clutch: Necessity of clutch in automobiles, Construction and working of a single plate, multiplate, centrifugal and semi - centrifugal clutch

Gear Box: Necessity of gear box in automobiles, Construction and working of a sliding mesh, constant mesh and synchromesh gear box, Universal Joints and Propeller Shaft, Necessity of Universal Joints & Propeller Shaft, Construction and working of cross or spider, yoke, ball and Trunion, and constant velocity type, universal type, Construction and working of enclosing type and hollow type propeller shaft, Construction and working of slip joint, Hotchkiss drive, torque tube drive,

UNIT - II

Differential Unit: Necessity of differential, Construction and working of a differential, Differential lock and self locking differential

Front and Rear Axles: Necessity of Front & Rear axle, Construction and working of live and dead axles, Construction and working of different types of stub axles, Construction and working of semi floating, three quarter floating and fully floating rear axles.

Wheels and Tyres: Function of wheel & tyres, Construction and working of Disc and spoke wheel, Types of rims and their construction, Construction & properties of tyres, Different tyre tread pattern, Specifications of a tyre, Tyre rotation, Vulcanizing and Retreading, Wheel balancing and static balancing

UNIT - III

ELECTRICAL SYSTEMS

Ignition System: Introduction, Study of wiring of Magnet ignition, Battery Coil Ignition and Electronic Ignition System,

Charging System: Introduction, Construction and working of charging dynamo (D. C. Generator), Working principle of cut - out, Voltage regulators - current regulators - construction and working, Construction & working of Alternator

Starting System: State the construction and working of a self starter (D. C. Motor), Working principle of bendix drive with a sketch, Solenoid construction and working

UNIT - IV

Lighting, Horn and Wipers: Introduction, Working of Head lamp, side or parking light, tail or stop light, dash light, direction signal light, Adjustments of head lights, Working of Dipper, Dim light, Door light & Destination board light, Horn circuit construction and working, Working of wiper

Battery: Introduction, Types of Batteries: - Primary & Secondary Batteries, Parts of lead acid battery, alkaline Battery, and its functions, Electrolyte ratio - by weight & Volume Understand the ampere hour and watt - hour efficiency of the battery, 11. 6 Know the different methods of charging and trickle charging, Know the different methods of testing of a lead - acid battery for full charged and discharged, condition, Cell damage testing: - sulphation, desulphation.

Books Recommended:

- Automotive Power Transmission Systems, Yingjin Zhang, Chris Mi
- Automobile Mechanical and Electrical Systems, Tom Denton
- A.K. Babu, Automobile Electricals and Electronics, Khanna Publishing House, New Delhi

Paper Title: UAMV – 493 AUTO ELECTRICAL SYSTEMS & TRANSMISSION LAB

List of Experiments:(Based on UAMV – 405)

- Construction and operation of clutching system
- Construction and operation gear boxes
- Layout of power transmission
- Construction and operation of differential
- Construction and operation of various axles
- Removing and installation of wheels and tyre
- Construction and operation of magneto and battery coil ignition system
- Construction and working of dynamo and alternator.
- Construction and working of starting system.
- Layout of charging system.
- Layout of various lighting system.
- Construction and operation of lead acid battery.
- Case study and trouble shooting of vehicle.

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Year - 3 Degree (SEMESTER - V)

Paper Title: UGEN – 501: INDIAN ECONOMY & SOCIAL CHANGES

Objective: The subject aims to cover a broad canvas of the Indian economy from independence to the present era including the possible social changes witnessed over the period of time.

UNIT - I

Indian Economy on the eve of Independence, British rule and its impact on Indian Economy, Emergence and development of Planning exercise in India - historical debates, plan models and shift in focus over time

UNIT - II

Output (National Income) and Employment Structure of Indian Economy; Composition and relative rates of growth of agriculture, industry and services sectors; Sub - sectoral analysis. Trends and patterns in structure of population over time - growth rate, gender, rural - urban, literacy, regional; Structure and trends of Poverty and Inequality (interpersonal and regional);

UNIT - III

Inflation - trends, structure and causes; Unemployment - trends, structure and types. Trends in Agricultural Production and Productivity; Land Reforms - Genesis, Progress and current status; Green Revolution - Measures and its effects. Trends and Patterns of Industrial Sector; Changes in the structure of Indian Industry; Small Scale Industries - Growth, Structure and its contribution in national economy; Public Sector - Growth, Structure, Historical role, Evolution and Dilution. Trends in Exports and Imports; Composition and Direction of Foreign Trade; Balance of Payments - Current Status

UNIT - IV

Introduction to different theories of social change, Social conditions and religious thought.

Books Recommended:

- R Dutta and K P M Sundaram: Indian Economy, S Chand
- A. N. Agarwal: Indian Economy, Problems of Development and Planning, New Age.
- Mishra and Puri: Indian Economy, Himalaya.
- Planning Commission: Eleventh Five Year Plan, Vol I, II and III, Academic Foundation.
- Government of India: Economic Survey (latest issue)

Paper Title: UGEN - 581 PRACTICE SESSION ON INDIAN ECONOMY & SOCIAL CHANGES

Planning for Practical session: (based on UGEN – 501)

- Data collection on Indian economy system
- PPT presentation on the current economic scenario
- Case studies on recent economic issues
- Graphical presentation to connect between economy and society

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Paper Title: UGEN – 502: RESEARCH METHODOLOGY

Objective: The course aims to teach the students to read, understand and explore something new from the conventional material before they climb up the ladder for more progressive research works.

UNIT - I

Foundations of Research: Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method - Understanding the language of research - Concept, Construct, Definition, Variable. Research Process (10%)

UNIT - II

Problem Identification & Formulation - Research Question - Investigation Question - Measurement Issues - Hypothesis - Qualities of a good Hypothesis - Null Hypothesis & Alternative Hypothesis. Hypothesis Testing - Logic & Importance (10%)

UNIT - III

Research Design: Concept and Importance in Research - Features of a good research design - Exploratory Research Design - concept, types and uses, Descriptive Research Designs - concept, types and uses. Experimental Design: Concept of Independent & Dependent variables.

UNIT - IV

Qualitative and Quantitative Research: Qualitative research - Quantitative research - Concept of measurement, causality, generalization, replication. Merging the two approaches.

Books Recommended:

- Research methodology by P. K. Manoharam
- Research methodology by Dr. C. Rajindra Kumar
- Research methodology methods and techniques by C. R. Kothari

Paper Title: UGEN - 582 PRACTICE SESSION ON RESEARCH METHODOLOGY

Planning for Practical session: (Based on UGEN – 502)

- Case studies
- Model paper presentation on assigned topics
- Survey and sample collection for project preparation

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Paper Title: UAMV – 503: TWO AND THREE WHEELERS

Job Role: Automobile Engineer

Objectives: This subject provides a detailed knowledge on how to maintain the two and three wheelers properly to enhance their longevity.

UNIT - I

POWER UNIT: Two stroke SI engine, four stroke SI engine; merits and demerits, Symmetrical and unsymmetrical port timing diagrams, Types of scavenging processes, merits and demerits, scavenging pumps, Rotary valve engine; Fuel system, Lubrication system. Magneto coil and battery coil spark ignition system, electronic ignition system; Starting system, Kick starter system.

UNIT - II

CHASSIS AND SUB - SYSTEMS: Mainframe and its types. Chassis and shaft drive, Single, multiple plates and centrifugal clutches. Gear box and gear controls. Front and rear suspension systems; Shock absorbers; Panel meters and controls on handle bar.

UNIT - III

BRAKES, WHEELS AND TYRES : Drum brakes, disc brakes, front and rear brake links, layouts, Spoked wheel, cast wheel, disc Wheel, disc types; Tyres and tubes.

UNIT - IV

TWO WHEELERS: Case study of major Indian models of motorcycles, scooters and mopeds, TVS mopeds and motorcycles, Hero Honda motorcycles, Bajaj scooters and motorcycles, Yamaha, Enfield motorcycles; Servicing and maintenance.

THREE WHEELERS: Case study of Indian models, Auto rickshaws, pickup van, delivery van and trailer, Maintenance: daily, weekly, monthly, Fault tracing.

Books Recommended:

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

Paper Title: UAMV – 591 TWO AND THREE WHEELERS LAB

List of experiments: (Based on UAMV – 503)

- Construction and operation of 4stroke SI engine.
- Construction and operation of 2stroke petrol.
- Fuel supply circuit of 2 wheeler and 3 wheeler.
- Operation of lubricating system.
- Operation of Magneto coil and Magneto coil ignition.
- Operation electronic ignition.
- Starting system and operation.
- Construction and working of clutching system.
- Construction and operation of Transmission Gear box.
- Construction and operation of suspension system.
- Construction and operation of Braking system.
- Fitment and operation of wheels, tyre and tube.
- Case study of motor cycles and scooter.

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Paper Title: UAMV – 504: AUTOMOTIVE AIR CONDITIONING

Job Role: Automobile Engineer

Objectives: This subject provides a good amount of knowledge on the operation, maintenance and repair of air condition systems.

UNIT - I

AIRCONDITIONING FUNDAMENTALS: Basic air conditioning system - location of air conditioning components in a car, schematic layout of a refrigeration system, compressor components, condenser and high pressure service ports, thermostatic expansion valve, expansion valve calibration, controlling evaporator temperature, evaporator pressure regulator, evaporator temperature regulator.

UNIT - II

AIR CONDITIONER - HEATING SYSTEM: Automotive heaters, manually controlled air conditioner, heater system, automatically controlled air conditioner and heater systems, automatic temperature control, air conditioning protection, engine protection.

UNIT - III

REFRIGERANT: Containers handling refrigerants, tapping into the refrigerant container, refrigeration system diagnosis, diagnostic procedure, ambient conditions affecting system pressures.

AIR ROUTING AND TEMPERATURE CONTROL: Objectives, evaporator airflow through the recirculating unit, automatic temperature control, duct system, controlling flow, vacuum reserve, testing the air control and handling systems.

UNIT - IV

AIR CONDITINING SERVICE: Air conditioner maintenance and service, servicing heater system removing and replacing components, trouble shooting of air controlling system, compressor service.

Books Recommended:

- William H. Crouse and Donald I. Anglin “Automotive Air conditioning” McGraw Hill
- Mitchell information Services, Inc “Mitchell Automatic Heating and Air Conditioning Systems” - Prentice Hall.
- Paul Weiser “Automotive Air Conditioning” Reston Publishing Co.
- MacDonald, K. I. , “Automotive Air Conditioning”, Theodore Audel series
- Goings L. F. “Automotive Air Conditioning” American Technical services
- Boyce H. Dwiggins “Automotive Air Conditioning”, Delmar
- Sadhu Singh, Refrigeration and Air Conditioning, Khanna Book Publishing.

Paper Title: UAMV – 592 AUTOMOTIVE AIR CONDITIONING LAB

List of experiments:(Based on UAMV – 504)

- Layout of car AC system
- Construction and operation of condenser and evaporator.
- Construction and operation of heating system.
- Case study of AC system.
- Controlling system of AC.
- Servicing of AC system.

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Paper Title: UAMV – 505: MOTOR VEHICLE ACT & POLLUTION CONTROL

Job Role: Automobile Engineer

Objectives: This course will enable the students to understand the fundamental laws and acts framed for motor vehicle and keeping the pollution under control.

UNIT - I

Motor vehicle act: Various section of the motor vehicle act, Licensing of drivers of motor vehicles, Registration of motor vehicles, Control of transport vehicles, Control of traffic, Insurance of motor vehicles, Offence - Penalties and Procedure, Mandatory signs, Accident claims, Accident claims tribunals.

UNIT - II

INTRODUCTION: Vehicle population assessment in metropolitan cities and contribution to pollution, effects on human health and environment, global warming, types of emission, transient operational effects on pollution.

POLLUTANT FORMATION IN SI ENGINES: Pollutant formation in SI Engines, mechanism of HC and CO formation in four stroke and two stroke SI engines, NOx formation in SI engines, effects of design and operating variables on emission formation, control of evaporative emission. Two stroke engine pollution.

UNIT - III

POLLUTANT FORMATION IN CI ENGINES: Pollutant formation in CI engines, smoke and particulate emissions in CI engines, effects of design and operating variables on CI engine emissions, Nox formation and control. Noise pollution from automobiles, measurement and standards

CONTROL OF EMISSIONS FROM SI AND CI ENGINES: Design of engine, optimum selection of operating variables for control of emissions, EGR, Thermal reactors, secondary air injection, catalytic converters, catalysts, fuel modifications, fuel cells, two stroke engine pollution controls.

UNIT - IV

MEASUREMENT TECHNIQUES EMISSION STANDARDS AND TEST PROCEDURE: NDIR, FID, Chemiluminescent analyzers, Gas Chromatograph, smoke meters, emission standards, driving cycles - USA, Japan, Euro and India. Test procedures - ECE, FTP Tests. SHED Test - chassis dynamometers, dilution tunnels.

Books Recommended:

- Paul Degobert - Automobiles and Pollution - SAE International ISBN - 1 - 56091 - 563 - 3. 2.
- Ganesan, V - "Internal Combustion Engines" - Tata McGraw - Hill Co.
- SAE Transactions - "Vehicle Emission" - 1982 (3 volumes).
- Obert. E. F. - "Internal Combustion Engines"
- Marco Nute - "Emissions from two stroke engines", SAE Publication.
- Springer and Patterson, Engine Emission, Plenum Press.
- Taylor. C. F. , Internal Combustion Engines, MIT Press.
- Heywood. J. B. , Internal Combustion Engine Fundamentals, McGraw Hill Book Co
- Babu, A.K. Automobile Engines, Khanna Publishing House

Paper Title: UAMV – 583 PRACTICE SESSION ON MOTOR VEHICLE ACT & POLLUTION CONTROL

List of experiments: (Based on UAMV – 505)

- Identification of Informatory, Warning and Mandatory Road Signs.
- Knowing various traffic signals.
- Familiarising with layout and identifying various items and parts of various emission controlling system e.g :-EGR system, Cat Con , PCV System and Fuel vapour Purge Control System.

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Year - 3 - Degree (SEMESTER - VI)

Paper Title: UGEN – 601: GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT

Objective: The classic blend of psychology and human resource will help to deal with the individuals in the corporate sector. The study of proper human mind is to be emphasized before the role of human resource management comes to play.

UNIT - I

Introduction to psychology, Nature of psychology; Basic concepts: Person, States of Consciousness: Sleep and Wakefulness and altered States of Consciousness, Behavior and Experience, II Evolution of the discipline of psychology; Psychology and other disciplines; Linkages across psychological processes

UNIT - II

Methods of psychology, The bases of human behavior, Evolutionary perspective on human behavior; Biological and cultural roots; Nervous system and endocrine system: Structure and relationship of with behavior and experience; Brain and behavior, Socialization, Enculturation and Acculturation; Globalization; Diversity and pluralism in the Indian context.

UNIT - III

Evolution and growth of human resource management (with special reference to Scientific management and Human relations approaches). Role of HR in strategic management. Nature, objectives, scope, and functions of HR management, Challenges of HR (the changing profile of the workforce - knowledge workers, employment opportunities in BPOs, IT and service industries, Flexi options), Workforce diversity (causes, paradox, resolution of diversity by management).

UNIT - IV

Concepts of line - staff in the structure of human resource department and the role of human resource manager, Manpower planning, Job analysis, Job evaluation.

Books Recommended:

- General Psychology by S. Dandapani, Neelkamal Publication (2016)
- General Psychology by R. K. Gupta
- Aswathappa K. (2002) Human Resource and Personnel Management, Tata McGraw - Hill, New Delhi.
- Bhattacharyya Kumar Deepak (2006) Human Resource Managing, Excel Books, New Delhi.
- Cascio F. W. (2003) Managing Human Resources, Productivity, Quality of Life, Profits, Tata Mc - Graw - Hill, New York.

Paper Title: UGEN - 681 PRACTICE SESSION ON GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT

Planning for Practical session: (Based on UGEN – 601)

- How to conduct counseling sessions
- Case studies
- PPT presentation on recent HR practices

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Paper Title: UGEN – 602: ENTREPRENEURSHIP DEVELOPMENT PROGRAMME

Objective: The course aim to give a shape to understand the validity of various entrepreneurship development programs in the field of economics and its related concepts.

UNIT - I

To make the students understand about entrepreneurs and different classifications. Entrepreneur and entrepreneurship - Definition; traits and features; classification; Entrepreneurs; Women entrepreneurs; Role of entrepreneur in Entrepreneurs in India, Create an awareness about EDP. Entrepreneurial development programme concept; Need for training; phases of EDP; curriculum & contents of Training Programme; Support systems, Target Groups; Institutions conducting EDPs in India and Kerala.

UNIT - II

General awareness about identification of project financing new enterprises; Promotion of a venture; opportunity Analysis Project identification and selection; External environmental analysis economic, social, technological and competitive factors; Legal requirements for establishment of a new unit; loans; Over run finance; Bridge finance; Venture capital; Providing finance in Approaching financing institutions for loans.

UNIT - III

To identify different Discuss opportunities in small business; Small business Enterprise - Identifying the Business opportunity in various sectors - formalities for setting up of a small business enterprise - Institutions supporting small business enterprise - EDII (Entrepreneurship Development Institute of India), SLDO (Small Industries Development Organization NSIC (National small Industries Corporation Ltd. (CNSIC) NIESBUD (National Institute for Entrepreneurship and small Business Development) Sickness in small business enterprise causes and remedies.

UNIT - IV

To understand about a project report relating to a small business; Project formulation - Meaning of a project report significance contents formulation planning commissions guidelines for formulating a project report - specimen of a project report, problems of entrepreneurs case studies of entrepreneurs.

Books Recommended:

- Cliffton, Davis S. and Fylie, David E. , Project Feasibility Analysis, John Wiley, New York, 1977.
- Desai A. N., Entrepreneur and Environment, Ashish, New Delhi, 1990.
- Drucker, Peter, Innovation and Entrepreneurship, Heinemann, London, 1985
- Jain Rajiv, Planning a Small Scale Industry: A guide to Entrepreneurs, S. S. Books, Delhi, 1984
- Kumar S. A. , Entrepreneurship in Small Industry, Discovery, New Delhi, 1990
- McClelland, D. C. and Winter, W. G. , Motivating Economic Achievement, Free Press, New York, 1969

Paper Title: UGEN - 682 PRACTICE SESSION ON ENTREPRENEURSHIP DEVELOPMENT PROGRAMME

Planning for Practical session: (Based on UGEN – 602)

- PPT presentation
- Case studies on Men/Women entrepreneurs
- Seminar on successful entrepreneurs
- Preparation of project work

Paper Title: UAMV – 683: INDUSTRIAL TRAINING

Job Role: Automobile Engineer

Industrial Training of 3 - 4 weeks of 6 credits in each year followed by Report Writing and Viva - voce. These trainings are to be carried out during summer vacations. These training may be done from industries/Skill knowledge providers (SKPs)/Sector Skill Councils (SSCs)/Training centers/Institutes. These credits will be evaluated in Semester VI.