SHIVAJI UNIVERSITY, KOLHAPUR
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PHONE : EPABX – 2609000, BOS Section – 0231-2609094, 2609487
Web : www.unishivaji.ac.in Email: bos@unishivaji.ac.in
शिवाजी विद्यापीठ, कोल्हापूर, ४१६ ००४, महाराष्ट्र
दूरध्वनी - इपीबीएक्स - २०६०९०००, अभ्यासमंडळे विभाग : ०२३१- २६०९०९४.
२६०९४८७
वेबसाईट : www.unishivaji.ac.in ईमेल : bos@unishivaji.ac.in

Estd. 1962
"A++" Accredited by NAAC (2021)
With CGPA 3.52

Ref.: SU/BOS/Voc./508 **Date: 10- 09- 2024**

To,
The Principals,
All Concerned Affiliated Colleges /Institutions.
Shivaji University, Kolhapur.

Subject : Regarding syllabi of B. Voc. Part III Courses under the Faculty of Inter-Disciplinary Studies as per National Education Policy, 2020. (1.0)

Sir/Madam,

With reference to the subject, mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabii of B.Voc. Part III Courses under the Faculty of Inter-Disciplinary Studies. as per National Education Policy, 2020. (1.0)

1	B.Voc. in Tourism and Service Industry
2	B.Voc. in Sustainable Agriculture Management
3	B.Voc. in Nutrition and Dietetics
4	B.Voc. in Nursing and Hospital Management
5	B.Voc. in Building Technology & Interior Design
6	B.Voc. in Agriculture
7	B.Voc. in Printing & Publishing
8	B.Voc. in Sustainable Agriculture
9	B.Voc. in Graphic Design
10	B.Voc. in Automobile

This syllabi shall be implemented from the academic year 2024-2025 onwards. A soft copy containing the syllabi is attached herewith and it is also available on university website www.unishivaji.ac.in. (NEP-2020@suk / Online Syllabus)

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours Faithfully

(Dr. S. M. Kubal)
Dy Registrar

Copy to:

1	The Dean, Faculty of IDS	6	Affiliation T. 1 & T. 2 Section
2	Director, Board of Examination and Evaluation	7	P.G.Admission Section
3	The Chairman, Respective Board of Studies	8	Appointment A & B Section
4	All On Exam Section O. E. I Section	9	P.G.Seminar Section
5	Eligibility Section	10	Computer Centre /I.T.cell

SHIVAJI UNIVERSITY, KOLHAPUR

Accredited By NAAC With A++ Grade

Faculty of Interdiciplinary Studies
structure, Scheme and Syllabus for
Bachelor of Vocation (B.voc)

AUTOMOBILE

Part - III sem. V & VI

NEP 2020 PATTERN

Syllabus to be implemented from

Academic Year 2024-25

To,

The Registrer

Shivaji University, Kolhapur

Subject : **Submisson Of B. Voc - III Year B, Voc Degree structure Automobile as per NEP guidelines.**

Dear Sir,

I'm submitting herewith Second Year**Bachelor of Vocation (B.Voc- III) Degree Course** Structure (LEVEL-6) to be implemented from Academic Year 2024-25 Kindly accept it and Acknowledge.

Thanking You!

Yours Faithfully,

Principal

Coordinator

BOS Chairman IDS

National Education Policy(NEP-2020)

Third Year Bachelor of Vocation (B. Voc.- Degree)Course Structure for (Level-7)

With Multiple Entry and Multiple Exit option

(To be implemented from the Academic Year 2024-25)

Semester V – Duration: 6 Months											
	Teaching Scheme					Evaluation Scheme					
Sr. No.	Course	No. of Lectures		Hours (T + P)	Credits	Theory	Internal/ Practical	Total Marks	Min Marks (Separate passing)	Exam Duration (Hrs.)	
		T	P							T	P
1.	AECC-E Business Communication in English -III	4	-	6	4	40	10	50	18	2	-
2.	GEC –E Alternative fuels and emission control techniques (4) + Seminar (2)	4	2	6	4	40	10	50	18	2	-
3.	DSC –E-I Industrial Organization and management	4	-	4	4	50	-	50	18	2	-
4.	DSC –E-II Automotive refrigeration and air conditioning	4	-	4	4	50	-	50	18	2	-
5.	DSC –E-III Vehicle hydraulics and pneumatics	4	-	4	4	50	-	50	18	2	-
6.	SEC-E-I Engine testing Lab	-	4	4	2	-	50	50	18	-	3
7.	SEC-E-II Body repair and Painting Lab	-	4	4	2	-	50	50	18	-	3
8.	SEC-E-III Refrigeration and air conditioning Lab	-	4	4	2	-	50	50	18	-	3

9.	SEC-E-IV Project-I	-	-	2	2	-	50	50	18	-	-
	Total	20	14	**36**	**28**	**230**	**220**	**450**	**-**	**-**	

Semester VI – Duration: 6 Months											
	Teaching Scheme					**Evaluation Scheme**					
Sr. No.	Course	No. of Lectures		Hours (T + P)	Credits	Theory	Internal/ Practical	Total Marks	Min Marks (Separate passing)	Exam Duration (Hrs.)	
		T	P							T	P
1.	AECC-F Business Communication in English -IV	4	-	6	4	40	10	50	18	2	-
2.	GEC –F Transport management and motor industries (4) + (2)	4	2	6	4	40	10	50	18	2	-
3.	DSC –F-I Automotive Electronics	4	-	4	4	50	-	50	18	2	-
4.	DSC –F-II Electric and Hybrid vehicles	4	-	4	4	50	-	50	18	2	-
5.	DSC –F-III Tractors ,Farm Equipment's and Special Purpose Vehicles	4	-	4	4	50	-	50	18	2	-
6.	SEC-F-I Automotive Electronics Lab	-	4	4	2	-	50	50	18	-	3
7.	SEC-F-II Tractor and Farm Equipment Lab	-	4	4	2	-	50	50	18	-	3

8.	SEC-F-III Automotive Diagnosis Lab	-	4	4	2	-	50	50	18	-	3
9.	SEC-F-IV Project-II	-	-	2	2	-	50	50	18	-	-
	Total	20	14	**36**	**28**	**230**	**220**	**450**	**-**	**-**	

• Student Contact Hrs Per week: 36 hrs	• Total marks for B.Voc.- Degree: 900
• Theory and Practical Lectures: 48 Minutes Each	• Total credits for B.Voc.- Degree: 56
• AECC: Ability Enhancement Compulsory Course **(Compulsory English)**	
• Practical workload will for batch of 20 students	
• Practical Examination will be conducted Semester wise for 50 Marks per course (subject).	
• DSC: Discipline Specific Core Course - Candidate can opt three courses (Subjects) from DSC.	
• GEC: Generic Elective Compulsory Course - Candidate can opt any one course (Subject).	
• There shall be separate passing for theory and practical courses.	
• AECC & GEC Internal Evaluation should be done at college or respective departmental level	
• **SEC-E & SEC-F are two parts of Vocational Degree Course**	

Eligibility:

Eligibility for Admission: Advance Diploma

Eligibility for Faculty: 1) Post Graduate with NET / SET/Ph. D. Or

2) Five Year Industry Experienced Personal

2) M. A. (English) with NET/SET/Ph.D for Buiness Communication in English

Eligibility for Lab Assistant: Graduation with related field

Staffing Pattern: **Teaching:** In the 1st year of B. Voc. – One Full Time

one C. H. B. for Business Communication

Lab. Assistant: For 1st Year of B. Voc. – 1 Part Time

For 2nd and 3rd Year (Inclusive of 1st Year) of B. Voc. – 1 Full Time

Bachelor of Vocation (B. Voc.) Part III - Sem. V

(AECC-ED)

Paper – I: Business Communication in English -III

Paper No: III **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory 40 + Internal 10)**

Units Prescribed for Theory: 40 Marks.

Course Outcomes: The students will acquire knowledge of

1. To develop awareness of the complexity of the communication process
2. To develop effective listening skills in students so as to enable them to comprehend instructions and become a critical listener
3. To develop effective oral skills so as to enable students to speak confidently interpersonally as well as in large groups
4. To develop effective writing skills so as enable students to write in a clear, concise, persuasive and audience centered manner
5. To develop ability to communicate effectively with the help of electronic media

Content of syllabus:

Unit–I: Concept of Communication (15 Hrs.)

Meaning, Definition, Process, Need, Feedback, Emergence of Communication as a key concept in the Corporate and Global world

Unit – II Impact of technological advancements on Communication (15 Hrs.)

Types- Internet, Blogs, E-mails, Moodle, Social media (Facebook, Tweeter &WhatsApp) Advantages and Disadvantages

Unit – III Problems in Communication (15 Hrs.)

Physical/ Semantic/Language / Socio-Cultural / Psychological / Barriers Ways to Overcome these Barriers

Unit – IV Listening Skills (15 Hrs.)

Importance of Listening Skills, Obstacles to listening, cultivating good Listening Skills

Practical: Based on the theory units: Marks: 10

Books Recommended: (List of Minimum 5 Books)

1. Agarwal, Anju D (1989) A Practical Handbook for Consumers, IBH.
2. Alien, R.K. (1970) Organizational Management through Communication.
3. Ashley, A (1992) A Handbook of Commercial Correspondence, Oxford University Press.
4. Aswal thapa, K (1991) Organizational Behavior, Himalayan Publication, Mumbai.
5. Atreya N and Guha (1994) Effective Credit Management, MMC School of Management, Mumbai.

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

(2. Students can use scientific calculators in theory examination.)

**********COMMON TO ALL**********

Pattern of a Question Paper

B. Voc. Part-III Semester –V

Business Communication in English -III(AECC-E)

Paper No: III

Time: 2 hours **Total Marks: 40**

Q.1 Do as directed questions items on unit 1 to be asked 10 (10 out of 12) **10**

Q.2 Write a letter of application **10**

OR

Draft a CV / Resume for a particular post

Q.3 Present a given information or a data using a table/ chart/pie diagram, etc. **10**

(any one diagram to be drawn)

Q.4 Fill in the blanks in the given interview **10**

Practical Evaluation:

Oral and presentation based on units prescribed 10 Marks

Practical evaluation:10 marks

Oral and presentation based on the units prescribed

*********************************COMMON TO ALL*********************************

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Generic Elective Compulsory Course (GEC– E)

Paper Title: Alternative fuels and emission control techniques

Paper No:A501 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory 40 + Internal 10)**

Practical: 2 lectures/week/batch

--------- **Course Outcomes:** The students will acquire knowledge of the conventional and non conventional fuels, emission measurement and control, emission effect on health.

1. **Conventional Fuels and Need for alternative fuels**
2. **Alternative Fuels I – Gaseous Fuels and Biofuel**
3. **Alternative Fuels II - Synthetic Fuels**
4. **Emission Control (SI Engine)**
5. **Emission Measurement and Control (CI Engine)**
6. **Health effects of Emissions from Automobiles**

Content of syllabus:

Unit I: **(10 Hrs)** Estimate of petroleum reserve and availability - comparative properties of fuels- diesel and gasoline, quality rating of si and ci engine fuels, fuel additives for si and ci engines. Thermodynamics of fuel combustion - introduction to chemical thermodynamics, chemical reaction - fuels and combustion, enthalpy of formation and enthalpy of combustion, first law analysis of reacting systems, adiabatic flame temperature. need for alternative fuels, applications, types etc**.**

Unit II: **(08 Hrs)** Introduction to CNG, LPG, ethanol, vegetable oils, bio-diesel, biogas, Hydrogen and HCNG.

Study of availability, manufacture, properties, storage, handling and dispensing, safety aspects, engine/vehicle

modifications required and effects of design parameters performance and

durability.

Unit III: **(08 Hrs)** Introduction to Syngas, DME, P-Series, GTL, BTL, study of production, advantages, disadvantages, need, types, properties, storage and handling, dispensing and safety, discussion on air and water vehicles.

Unit IV: **(08 Hrs)** Emission formation in S.I. engines - Hydrocarbons, carbon monoxide, oxides of nitrogen, polyneculear aromatic hydrocarbon, effects of design and operating variables on emission formation in spark ignition engines, controlling of pollutant formation in engines exhaust after treatment, charcoal canister control for evaporative emission control, emissions and drivability, positive crank case ventilation system for ubhc emission reduction

Unit V: **(08Hrs)** Chemical delay, intermediate compound formation, pollutant formation on incomplete

combustion, effect of design and operating variables on pollutant formation, controlling of emissions, emissions

and drivability, exhaust gas recirculation, exhaust after treatment – doc, dpf, scr and lnt. measurement and test

procedure (ndir analyzers, fid, chemiluminescence nox analyzer, oxygen analyzer, smoke measurement, constant

volume sampling, particulate emission measurement, orsat apparatus.

Unit VI: **(06Hrs)** Emission effects on health and environment. Emission inventory, ambientair quality

monitoring,

Emission Norms: As per Bharat Standard up to BS– IV.

Books Recommended: (List of Minimum 5 Books)

1. "Alternative Fuels", Dr. S. S. Thipse, Jaico publications.
2. "Engine Emission", B.P Pundir, Narosa publication.
3. "Internal Combustion Engines", V .Ganesan, Tata McGraw Hill.
4. "Automotive Emission Control", Crouse, W.M. and. Anglin, A.L, McGraw Hill.
5. "IC Engines", Dr. S. S. Thipse, Jaico publications.
6. "Engine Emissions, pollutant formation", G.S .Springer and D.J. Patterson, Plenum Press.
7. ARAI vehicle emission test manual.

Note: (If any - such as

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2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Discipline Specific Core Course (DSC– E-I)

Paper Title: **Industrial organization & Management**

Paper No: A502 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

--------- **Course Outcomes:** The students will acquire knowledge of organization , ownership , leadership and management.

1. **Organization**
2. **Forms of Ownership**
3. **Purchasing and Marketing Management**
4. **Personal Management**
5. **Motivation, Leadership and Entrepreneurship**
6. **Management Information System**

Content of syllabus:

Unit I: **(8 Hrs)**System approach applied to Organization, Necessity of Organization,Principles of Organization, Formal and Informal Organizations Management. Functions of Management, Levels of Management, Managerial Skills,Importance of Management, Models of Management

Theory of Management

Scientific Management Approach, Administrative ManagementApproach, Behavioural Management Approach,

Modern Management

Theories

Unit II: **(10 Hrs)** Single Ownership, Advantages and limitations, Partnership, Types ofPartners, Advantages

and limitations, Joint Stock Company, Formation ofJoint Stock Company, Advantages and limitations, Co –

operativeSocieties, Types of Co, operatives, Advantages and limitations, Co –operative Societies, Types of Co –

operatives – Advantages andlimitations, Public Corporations, Advantages and limitations

Organizational

Structure

Line Organization, Advantages and dis–advantages, Functional Organization, Advantages and dis–advantages,

Line and Staff Organization , Advantages and dis– advantages, Committee OrganizationAdvantages and dis –

Advantages

Unit III: **(06 Hrs)** Purchasing – Introduction, Functions of Purchasing Department, Methodsof Purchasing,

Marketing, Introduction, Functions of Marketing, Advertising

Unit IV: **(08 Hrs)** Introduction, Functions of Personal Management, Development of PersonalPolicy, Manpower Planning, Recruitment and Selection of manpower – Scientific selection, Training and Development of manpower, JobAnalysis, Job Evaluation and Merit Rating, Wages and Incentives

Unit V: **(08 Hrs)** Motivation, Human needs Maslow's Hierarchy of needs, Motivation – Introduction, Types of
Motivation, Attitude Motivation; GroupMotivation; Executive Motivation, Techniques of Motivation.
Leadership – introduction Qualities of a good Leader, Leadership Approach
Entrepreneurship – Introduction Entrepreneurship Development, Entrepreneurial Characteristics, Need for
Promotion of Entrepreneurship, Steps for establishing small scale unit

Unit VI: **(08 Hrs)** Data and Information, Need, function and Importance of MIS, Evolution of MIS, Organizational Structure and MIS, Computers and MIS,Classification of Information Systems

Books Recommended: (List of Minimum 5 Books)

1. "Industrial Engineering Handbook" , Editor – in – Chief, 4th Edition, McGraw Hill, 19xx E.S. Buffa and R. K. Sarin
2. "Modern Production / Operations Management", 8th Edition, Wiley, 1987 H. J. Arnold andD. C. Feldman
3. "Organizational Behavior" , McGraw – Hill, 1986 J. A. Senn,
4. "Information Systems in Management " , 4th Edition, Wadsworth Inc., 1990 P. Hershey andK. H. Blanchard,
5. "Management of Organizational Behavior – Utilizing Human Resources ", 4th Edition,Prentice – Hall Inc., 1982 M. Mahajan,
6. "Industrial Engineering and production Management" ,Dhanpat Rai and Co. (P) Ltd. , Delhi,2002 S. Sadagopan,
7. "Management Information System", Prentice Hall of India Pvt Ltd, 1997 C. B. Mamoria
8. "Personnel Management", Himalaya Publishing House – 1989
9. "Industrial Engineering and Management" , O. P. Khanna, Dhanpat Rai Publications (P) Ltd.,2007

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Discipline Specific Core Course (DSC– E-II)

Paper Title: Automotive refrigeration and air conditioning

Paper No: A503 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

--------- **Course Outcomes:** The students will acquire knowledge of refrigeration cycles, A/C system, Psychometric processes, automatic temperature control,repairing.

1. **Refrigeration Fundamentals**
2. **Refrigerants and Air conditioning Components**
3. **Air distribution system**
4. **Psychrometry**
5. **Air Routing & Temperature Control**
6. **Diagnostics, Trouble Shooting, Service and Repair**

Content of syllabus:

Unit I: **(08 Hrs)** Introduction to refrigeration and vapour compression system, cycle diagram (Carnot cycle, Reverse Carnot cycle, Simple vapor compression cycle, bell Coleman cycle), effects of various operating parameters on performance of A/C System, Vapour absorption refrigeration system(No numerical), Applications of refrigeration and air conditioning

Unit II: **(08 Hrs)** Environmental concerns/Legislation for automotive A/C systems, types and properties of refrigerants, refrigerant oils, refrigerant piping. Future refrigerants, Air conditioning components: Compressors, Condensers, flow control devices, evaporators – Design guidelines, types, sizing and their installation. Accumulators, receiver driers and desiccants. Refrigerant charge capacity determination.

Unit III: **(08 Hrs)** Comfort conditions, Air management and heater systems, air distribution modes (Fresh/Recirculation, Face, Foot, Defrost, and Demist), A/C ducts and air filters. Blower fans, Temperature control systems(manual/semiautomatic, automatic). Vehicle operation modes and Cool- down performance.

Unit IV: **(06 Hrs)** Psychometric properties, tables, charts, Psychometric processes, Processes, Combinations and Calculations, ADP, Coil Condition line, Sensible heat factor, Bypass factor.

Unit V: **(08 Hrs)** Objectives, evaporator air flow, through the re-circulating uni automatic temperature control, duct system, controlling flow, vacuum reserve, testing the air control of air handling systems.

Unit VI: **(10 Hrs)** Initial vehicle inspection, temperature measurements, pressure gauge reading and cycle testing, leak detection and detectors, Sight glass. Refrigerant safety/handling, refrigerant recovery; recycle and charging, system oil, system flushing, odour removal, retrofitting. Removing and replacing components, Compressor service

Books Recommended: (List of Minimum 5 Books)

Text Books:

Mark Schnubel, “Automotive Heating & Air Conditioning", Thomson Delmar

Learning, 3rdedition, NY.

1. William H. Crouse & Donald L. Anglin, "Automotive Air Conditioning. Mc Graw Hill, Inc., 1990.

2. ASHRAE Handbook-1985 Fundamentals

4.Boyace H. Dwiggins, ”Automotive Air – conditioning”

5.SamSugarman, “HVAC Fundamentals. Fairmont Press, ISBN0-88173-489-6.

6.Paul Weisler, "Automotive Air Conditioning, Reston PublishingCo.Inc.1990.

7.Paul Lung, "Automotive Air Conditioning, C.B, S. Publisher & Distributor, Delhi.

8.MacDonald K. L “ Automotive Air Conditioning “, TheodoreAudel series, 1978

Note: (If any - such as

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Bachelor of Vocation (B. Voc.) Part II - Sem. V

Discipline Specific Core Course (DSC– E-III)

Paper Title: Vehicle hydraulics and Pneumatics

Paper No: A504 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

--------- **Course Outcomes:** The students will acquire knowledge of fluid fundamentals, centrifugal pumps, devices, hydraulic and pneumatic circuit.

1. **Overview of Fluid Mechanics.**
2. **Hydraulic Devices**
3. **Miscellaneous Fluid Machines**
4. **Basic Components Of Hydraulic and Pneumatic Systems**
5. **Accessories of Hydraulic and Pneumatic Systems**
6. **Hydraulic and Pneumatic Circuits**

Content of syllabus:

Unit I:**(08 Hrs)** Fluid Fundamentals - Classification of Fluid, Properties of fluids like Specific Weight, Specific gravity, Surface tension, Capillarity, Viscosity.Specification of hydraulic oil, Pascal's law, Types of fluid flow- Steady, unsteady, rotational, irrational, laminar, turbulent, one, two and three dimensional flow, Uniform and non- uniform flow. (Definitions and applications only)Pressure Measurement .Concept of atmospheric pressure, gauge pressure, vacuum pressure, Absolute Pressure, Pressure Gauges - Piezometer tube, simple and differential manometer, Manometer, Bourdon tube pressure gauge. Hydrodynamics, Basic principles of fluid flow, Law of continuity and its applications, Energy possessed by the liquid in motion. Bernoulli's theorem and its applications such as Venturimeter, Orificemeter and pilot tube

Unit II: **(08 Hrs)** Centrifugal Pumps - Types, Construction and working of centrifugal pump, Types of casing. Need of priming, Heads, Losses and Efficiencies of Centrifugal Pump, Net positive suction head(NPSH), Fault findings and remedies, Pump selection. Reciprocating Pumps - Construction and Working of single and Double Acting Reciprocating pump, Reasons of cavitation and separation. Comparison between Reciprocating and Centrifugal Pump

Unit III: **(08 Hrs)** Simple Hydraulic Devices - Working principles, construction and applications of Hydraulic jack,

Hydraulic ram, Hydraulic lift, Hydraulic press. Other Pumping Devices- Gear pumps used in hydraulic circuits, Vane

type, Swash plate type pump. Comparison of above pumps for various characteristics and their applications.

Unit IV: **(06 Hrs)** Hydraulic and Pneumatic actuators. Hydraulic Actuators - Hydrauliccylinders (single, double acting and telescopic) –construction andworking, Hydraulic motors(gear and piston type) – construction andworking Pneumatic Actuators - Pneumatic cylinders (single and doubleacting)

construction and working, Air motors (gear and piston type)construction and working Valves for Hydraulic and Pneumatic systems Classifications of valves, poppet, ball, needle, throttle, pressure control directional control, sequencing synchronizing ,rotary spool, sliding spool two position, multi position. Non-return valves. Proportionating valve Construction and operation of above valves.

Unit V: **(08 Hrs)** Filters - Hydraulic filters and strainers – full flow and proportional types,function and working, difference between filters and strainers .Pneumatic filters –screen type and mechanical type, function andworking, FRL unit Hoses and Connectors for hydraulic and pneumatic systems - Types, construction and applications. Seals and Gaskets for hydraulic and pneumatic systems-Types, function,

Unit VI: **(10 Hrs)** Hydraulic Circuits, Hydraulic symbols**,** Meter in, Meter out. Bleed off, Sequencing, Introduction to electro-hydraulics – concept, principles and applications**,** Applications of hydraulic circuits – Hydraulic power steering, Hydraulic brakes, milling machine, hydraulic press,Simple Pneumatic Circuits Pneumatic symbols, Speed control circuit (Meter in, Meter out), Sequencing, Applications of pneumatic circuits – Air brake, Low cost Automation in industries, Pneumatic power tools(drill, hammer, and grinder), Comparison of Hydraulic and pneumatic circuits.

Books Recommended: (List of Minimum 5 Books)

1.Dr. P. N. Modi, Dr. S.M. Seth - Hydraulic and Fluid Mechanics Standard Book House, Delhi

2.Pippengen and Hicks Industrial Hydraulics Tata McGraw Hill Int.

3.S. Ilango and V. Soundararajan - Introduction to Hydraulics And Pneumatics, PHI Learning Private Limited, New Delhi.

4.Anthony Esposito Fluid Power PEARSON Education, Noida

5.R.J. Garde and A.G. Mirajgaoker Engineering Fluid Mechanics SITECH Publications(India) PVT. LTD.

6.K. Shanmuga Sundaram - Hydraulic and Pneumatic, Controls S. Chand

Note: (If any - such as

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2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Skill Enhancement Courses (SEC– E-I)

Paper Title: Engine testing Lab.

Paper No: P51 **Credits: 02**

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. smoke measurement of HC, CO, CO2, O2 using exhaust gas analyser.
2. Morse test on petrol and diesel engines.
3. Valve timing and port timing diagrams.
4. Morse test on S.I. and .I. Engine.
5. Heat balance test.

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

1. Study of Pressure pickups, charge amplifier, storage oscilloscope and signal analysers usedfor IC engine testing.
2. Performance study of petrol and diesel engines both at full load and part load conditions.
3. Morse test on petrol and diesel engines.
4. Determination of compression ratio, volumetric efficiency and optimum cooling water flowrate in engines.
5. Heat balance test on an automotive engine. Testing of 2 and 4 wheelers using chassis dynamometers.
6. Measurement of HC, CO, CO2, O2 using exhaust gas analyser
7. Diesel smoke measurement.
8. Sectional working model for four stroke cycle diesel engine.
9. Sectional light weight models of IC Engine, injection system and carburetor, sectionalworking model for 2 stroke petrol engine.
10. Valve timing and port timing diagrams.

Student Instructions:

1. Four to five experiments shall be selected for practical examination.

2. Carry lab manual and calculator.

Laboratory Requirements:

1.Engine testing lab/Instruments.

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Skill Enhancement Courses (SEC– E-II)

Paper Title: Body repair and painting Lab

Paper No: P52 **Credits: 02**

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. Identification of various metals.

2. Stepwise painting process.

3. Anticorrosion treatment to the vehicle.

4. Adhesion testing.

5. polishing /refinishing operation on vehicle.

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

1. Remove and refit body panels, doors, floors, wheel boxes and fenders, wind shield glasses
2. To carryout body repair by different welding processes on a vehicle
3. To carryout polishing /refinishing operation on vehicle
4. Identification of various metals.
5. Metal surface cleaning (manually) & Surface cleaning (chemical)
   1) Pickling 2) Deareasing 3) Degusting 4) Phosphate 5) Passivation 6) Activation 7) Electroplating
   8) Viscosity measurement by ford cup.
6. Buffing on metals.
7. Stepwise painting process
8. Dent removing process/ denting painting
9. Anticorrosion treatment to the vehicle
10. Adhesion testing
11. Colour gloss test by gloss meter
12. P.H. value testing

Student Instructions:

1. Use of mask and safety goggle compulsory while polishing and painting

2. Four to five experiments shall be selected for practical examination.

Laboratory Requirements:

1. Denting Painting Lab.

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Skill Enhancement Courses (SEC– E-III)

Paper Title: Refrigeration and air conditioning

Paper No: P53 **Credits: 02**

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. Installation/operations/maintenance practices for refrigeration systems.
2. leak testing and leak detection methods.
3. demonstration of controls in refrigeration.
4. various methods of transport refrigeration systems.
5. latest trends in automotive refrigeration systems.

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

1. Test on vapour compression test rig.
2. Test on air conditioning test rig.
3. Study of various methods of transport refrigeration systems.
4. Study and demonstration on car and bus air conditioning system.
5. Study of latest trends in automotive refrigeration systems.
6. Study and demonstration of controls in refrigeration.
7. Study of different components with the help of cut sections/models/charts- Compressor, Condenser,Evaporators, Expansion device, Blower fans, Hating systems etc.
8. Study of installation/operations/maintenance practices for refrigeration systems.
9. Study of leak testing and leak detection methods.
10. Visit to maintenance shop of automotive air conditioning and writing report on it.

Student Instructions:

1. **Carry your own lab manual.**
2. **Visit to maintenance shop is compulsory.**

Laboratory Requirements:

1. Refrigeration and Air conditioning Lab.

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. V

Skill Enhancement Courses (SEC– E-IV)

Paper Title: Project-I

Paper No: P54 **Credits: 02**

Term Work: 2 lectures/week **Total Marks: 50(Internal)**

--------- 1. To provide an opportunity to students do work independently on a topic/ problem/ experimentation

selected by them and encourage them to think independently on their own to bring out the conclusion

under the given circumstances of the curriculum period in the budget provided with the guidance of

the teachers.

2. To encourage creative thinking process to help them to get confidence by planning and carrying out

the work plan of the project and to successfully complete the same, through observations, discussions

and decision making process. Project Load: Maximum 9-10 students in one batch, involving 03

groups Maximum 9-10 students shall work under one Faculty Member Group of one student is not

allowed under any circumstances.

Project Definition: Project work shall be based on any of the following:

1. Fabrication of product/ testing setup of an experimentation unit/ apparatus/ small equipment, in a

group.

2. Experimental verification of principles used in Mechanical Engineering Applications.

3. Projects having valid database, data flow, algorithm, and output reports, preferably software based.

Project Term Work: 100 Marks

The term work under project submitted by students shall include and assessment of Term work should

be as below

Marks : 1 Work Diary: 20 Marks for Semester V Work Diary maintained by group and countersigned

by the guide weekly. The contents of work diary shall reflect the efforts taken by project group for

1. Searching suitable project work

2. Brief report preferably on journals/ research or conference papers/ books or literature surveyed to

select and bring out the project.

3. Brief report of feasibility studies carried to implement the conclusion.

4. Rough Sketches/ Design Calculations, etc. 2

Synopsis: The group should submit the synopsis in following form.

1. Title of Project

2. Names of Students

3. Name of Guide

4. Relevance

5. Present Theory and Practices

6. Proposed work

7. Expenditure

8. References The synopsis shall be signed by the each student in the group, approved by the guide

and endorsed by the Head of the Department

Bachelor of Vocation (B. Voc.) Part III - Sem. VI

(AECC-F)

Paper – I: Business Communication in English -III

Paper No: III **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory 40 + Internal 10)**

Units Prescribed for Theory: 40 Marks.

Course Outcomes: The students will acquire knowledge of

1. To understand and demonstrate writing and speaking processes through invention, organization, drafting, revision, editing, and presentation.
2. To understand the importance of specifying audience and purpose and to select appropriate communication choices.
3. To understand and appropriately apply modes of expression, i.e., descriptive, expositive, narrative, scientific, and self-expressive, in written, visual, and oral communication.
4. To participate effectively in groups with emphasis on listening, reflective thinking, and responding.
5. To develop the ability to research and write a documented paper and/or to give an oral presentation.

Content of syllabus:

Unit–I: Theory of Business Letter Writing (15 Hrs.)

Parts, Structure, Layouts—Full Block, Modified Block, Semi - Block

Principles of Effective Letter Writing, Principles of effective Email Writing

Unit – II Personnel Correspondence (15 Hrs.)

Statement of Purpose

Job Application Letter and Resume, Letter of Acceptance of Job Offer, Letter of Resignation

Unit – III Language and Writing Skills (15 Hrs.)

Paragraph Writing -Developing an idea, using appropriate linking devices, etc. Cohesion and Coherence, self-editing, etc. [Interpretation of technical data, Composition on a given situation, a short informal report etc.]

Unit – IV Interviews (15 Hrs.)

Preparing for an Interview

Types of Interviews – Selection, Appraisal, Grievance, Exit, Group Discussion

Practical: Based on the theory units: Marks: 10

Books Recommended: (List of Minimum 5 Books)

1. Bahl, J. C. and Nagamia, S.M. (1974) Modern Business Correspondence and Minute Writing.
2. Balan, K.R. and Rayudu C.S. (1996) Effective Communication, Beacon New Delhi.
3. Basu, C.R. (1998) Business Organisation and Management, T.M.H. New Delhi.
4. Banerjee, Bani P (2005) Foundation of Ethics in Management Excel Books
5. Businessworld Special Collector's Issue: Ethics and the Manager

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

(2. Students can use scientific calculators in theory examination.)

Pattern of a Question Paper

B. Voc. Part-III Semester –VI

Business Communication in English -III(AECC-E)

Paper No: III

Time: 2 hours **Total Marks: 40**

Q.1 Do as directed questions items on unit 1 to be asked 10 (10 out of 12) **10**

Q.2 Write a letter of Business **10**

OR

Draft a CV / Resume for a particular post

Q.3 Present a Paragraph Writing **10**

Q.4 Fill in the blanks in the given interview **10**

Practical Evaluation:

Oral and presentation based on units prescribed 10 Marks

Practical evaluation:10 marks

Oral and presentation based on the units prescribed

********************************COMMON TO ALL********************************

Bachelor of Vocation (B. Voc.) Part II - Sem. VI (Degree)

Generic Elective Compulsory Course (GEC– F)

Paper Title: Transport management and motor industries

Paper No: A601 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory 40 + + Internal 10)**

Practical: 2 lectures/week/batch

--------- **Course Outcomes:** The students will acquire knowledge of state and interstate permits, traffic rules, signals and controls, accidents, taxation, insurance, Traffic navigation.

1. **Motor Vehicle Act**
2. **Taxation**
3. **Insurance**
4. **Passenger Transport Operation**
5. **Goods Transport**
6. **Advance Techniques in Traffic Management and Motor Industry**

Content of syllabus:

Unit I:**(10 Hrs)** Short titles and definitions, laws governing to use of motor vehicle and vehicle transport, licensing of drivers and conductors, registration of vehicle, state and interstate permits, traffic rules, signals and controls, accidents, causes and analysis, liabilities and preventive measures, rules and regulations, responsibility of driver, public and public authorities, offences, penalties and procedures, different types of forms, government administration structure, personnel, authorities and duties, rules regarding construction of motor vehicles. new motor vehicle act.

Unit II: **(08 Hrs)** Objectives, structure and methods of laving taxation, onetime tax, taxexemption and tax renewal.

Unit III: **(10 Hrs)** Insurance types and significance, comprehensive, third party insurance, zero depth insurance, furnishing of particulars of vehicles involved in accident, mact (motor accident claims tribunal), solatium fund, hit and runcase, duty of driver in case of accident, surveyor and loss assessor, surveyor's report estimation and valuation of vehicle: role of surveyor procedure of survey and valuation of vehicle. Accident survey report. importance of warranty system and protection of law: how to deal with
defects, benefits of warranty system.

Unit IV: **(10 Hrs)** Structure of passenger transport organizations, typical depot layouts, requirements and problems on fleet management, fleet maintenance, planning - scheduling operation and control, personal and training- for drivers and conductors, public relations, propaganda, publicity and passenger amenities, parcel traffic., theory of fares-basic principles of fare charging, differential rates for different types of services, depreciation anddebt charges, operation cost and revenues, economics and records workingof various state transport organizations.(MSRTC, BEST)

Unit V: **(08 Hrs)** Structure of goods transport organizations, scheduling of goods transport, management information system (mis) in passenger / goods transport
operation, storage and transportation of petroleum products.

Unit VI: **(10 Hrs)** Traffic navigation, global positioning system functions and role ofautomobile industry: the automobile industry in india (collection of data ofvarious companies) various research organizations like-central institute ofroad transport, automotive research association of india, vehicle research,development and establishment, central road research institute and petroleum conservation and research association

Books Recommended: (List of Minimum 5 Books)

1. P. Sudarsanam. Passenger Amenities in STU CIRT, Pune
2. P. Sudarsanam. Fare structure in STU CIRT, Pune
3. P. Sudarsanam. Bus station Management CIRT, Pune.
4. P. Sudarsanam Bus and Crew scheduling CIRT, Pune.
5. O.P. Khanna Industrial Organization and Management , Dhanpat Rai and sons
6. P.G. Patankar.Director.Compedium of Transport Terms, CIRT, Pune
7. Bharat Kalaskar Vahan Mitra Sanjivini Prakashan, Pune
8. Book Of The Car -Drive Publications Limited Automobile Association

Motor Vehicle Acts

1. Motor Vehicle Act, 1988 Home Department (M .S.)
2. Central M. V. Rules 1989 Home Department (M .S

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Discipline Specific Core Course (DSC– F-I)

Paper Title: Automotive electronics

Paper No: A602. **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

--------- **Course Outcomes:** The students will acquire knowledge of Current trends in modern automobiles, Generation of direct current, ignition system, Basic sensor arrangement, Types of sensors, Open loop and closed loop control systems.

1. **Automotive Electronics**
2. **Charging System**
3. **Ignition Systems**
4. **Electronic Fuel Injection and Ignition Systems**
5. **Sensors and Actuators**
6. **Digital Engine Control System**

Content of syllabus:

Unit I: **(08 Hrs)** Current trends in modern automobiles Open and close loop systems- Components for electronic engine management. Electronic managementof chassis system. Vehicle motion control.

Unit II: **(10 Hrs)** Generation of direct current. Shunt generator characteristics. Armature reaction. Third brush regulation. Cut-out. Voltage & current regulators. Compensated voltage regulator alternators principle & constructional
aspects and bridge benefits

Unit III: **(08 Hrs)** Types, Construction & working of battery coil and magneto ignition systems. Relative merits, Centrifugal and vacuum advance mechanisms, types and construction of spark plugs, electronic ignition systems.

Unit IV: **(10 Hrs)** Introduction, feedback carburettor systems. Throttle body injection and multi-port or point fuel injection. Fuel injection systems, Injection system controls. Advantages of electronic ignition systems: Types of solid-state ignition systems and their principle of operation, Contact less electronic

ignition system, and electronic spark timing control

Unit V: **(08 Hrs)** Basic sensor arrangement, Types of sensors such as-Oxygen sensors, Crank angle position sensors-Fuel metering/vehicle speed sensor and detonation sensor-Altitude sensor, flow sensor. Throttle position sensors.

Solenoids, stepper motors, and relays.

Unit VI: **(10 Hrs)** Open loop and closed loop control systems-Engine cranking and warm up control-Acceleration enrichment-Deceleration leaning and idle speed control. Distributor less ignition-Integrated engine control systems,

Exhaust emission control engineering.

Books Recommended: (List of Minimum 5 Books)

1. Kholi. P.L., Automotive Electrical Equipment, Tata McGraw-Hill Co. Ltd. New Delhi, 19752. Young. 2. A.P., & Griffiths. L., Automobile Electrical Equipment, English Language Book Society & New Press, 1990.

3. Vinal. G.W. ,Storage Batteries, John Wiley & Sons Inc., New York, 1985.

4. Crouse. W.H. ,Automobile Electrical Equipment, McGraw Hill Book Co Inc., New York, 1980 5. Spreadbury. F.G. Electrical ignition Equipment, Constable & Co. Ltd., London 1962.

5. Design methods of safety critical electronic automotive system by Fulep timea.

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Discipline Specific Core Course (DSC– F-II)

Paper Title: Electric and Hybrid vehicles

Paper No: A603 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

---------- **Course Outcomes:** The students will acquire knowledge of Electric vehicle, hybrid vehicles, Fuel cell, Continuously Variable transmission (CVT), Energy Storage Technology, Nonelectric Hybrid Systems

1. **Electric Vehicles and Motors**

2. **Hybrid Vehicles and Propulsion Methods Introduction**

3. **Hybrid Architecture and Power Plant Specifications Series**

4. **Fuel Cells**

5. **Sizing the Drive System and Energy Storage Technology**

6. **Nonelectric Hybrid Systems**

Content of syllabus:

Unit I: **(08 Hrs)** Electric vehicle, introduction, components, advantages, disadvantages, applications, vehicles. DC motors series wound- shunt wound- compoundwound and separately excited motors AC motors Induction- synchronous-brushless DC motor- switched reluctance motors.

Unit II: **(08 Hrs)** Introduction to hybrid vehicles performance characteristics of road vehicles; calculation of road load- predicting fuel economy- gridconnected hybrids.

Unit III: **(08 Hrs)** Configuration locomotive drives- series parallel switching- load tracking architecture. Pre transmission parallel and combined configurations Mildhybrid- power assist- dual mode- power split- power split with shift-Continuously Variable transmission (CVT)- wheel motors. Grade andcruise targets- launching and boosting- braking and energy recuperation- drive cycle implications.

Unit IV: **(06 Hrs)** Fuel cell characteristics- fuel cell types – alkaline fuel cell- proton exchange Membrane; direct methanol fuel cell- phosphoric acid fuel cell- molten carbonate fuel cell- solid

oxide fuel cell- hydrogen storage systems- reformers- fuel cell EV- super and ultra-capacitors- PEM fuel cell vehicles.

Unit V: **(08 Hrs)** Matching electric drive and ICE; sizing the propulsion motor; sizingpower electronics. Battery basics; lead acid battery; different types of batteries; battery parameters.

Unit VI: **(10 Hrs)** Short term storage systems flywheel accumulators. Continuously variable transmissions hydraulic accumulator'shydraulic pumps/motors-pneumatic hybrid engine systems operation modes.

Books Recommended: (List of Minimum 5 Books)

1. ''The Electric Car: Development and Future of Battery- Hybrid and Fuel Cell Cars'', MikeWestbrook- M H Westbrook- British library Cataloguing in Publication Data.
2. ''Electric and Hybrid Vehicles'',Robin Hardy- Iqbal Husain- CRC Press.
3. "Propulsion Systems for Hybrid Vehicles", John M. Miller Institute of Electrical Engineers-London. 4."Alternative Fuels", S.S.Thipse, Jaico publications
4. Energy Technology Analysis Prospects for Hydrogen and Fuel Cells- International Energy Agency-France.
5. Handbook of Electric Motors- Hamid A Toliyat- Gerald B Kliman- Marcel Decker Inc.

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Discipline Specific Core Course (DSC– F-III)

Paper Title: Tractors ,Farm Equipment's and SpecialPurpose Vehicles

Paper No: A604 **Credits: 04**

Theory: 4 lectures/week **Total Marks: 50 (Theory)**

---------- **Course Outcomes:** The students will acquire knowledge of Different types of earth moving equipment's, Basic types of transmissions, final drives, rubber spring suspension and air spring suspension, steering of tracked vehicles, Power steering types, Types of maintenance, Selection of machines.

1. **EQUIPMENTS AND OPERATION**

2. **ENGINE**

3. **UNDER CARRIAGE AND SUSPENSION**

4. **STEERING AND BRAKES**

5. **EARTH MOVING EQUIPMENTS MAINTENANCE & SAFETY**

6. **METHODS OF SELECTION OF EQUIPMENTS**

Content of syllabus:

Unit I: **(08 Hrs)** Different types of earth moving equipment's and their applications. Dozers, Loaders, Shovels, Excavators, Scrapers, Motor graders, Rollers, Compactors, Tractors and Attachments.

Unit II: **(08 Hrs)** All systems of engine and special features like Automatic injection timer, turbochargers, after coolers etc

TRANSMISSIONS AND FINAL DRIVES

Basic types of transmissions,auxiliary transmission,compoundtransmission, twin triple countershaft transmissions and planetary transmission, constructional and workingprinciples, hydro shift automatic Transmission and retarders. FINAL DRIVES: types of reductions like,single reduction, double reduction final drives and planetary final drives,PTO shaft

Unit III: **(08 Hrs)** Tyre and tracked vehicles , advantages and disadvantages, under carriage components like , tracks, roller frames, drive sprockets, track rollers, trackchains and track shoes. SUSPENSION: rubber spring suspension and air spring suspension

Unit IV: **(06 Hrs)** Power steering types like, linkage type power steering, semi integral power steering & integral power steering. STEERING OF TRACKED VEHICLES Skid steering,

articulated steering, clutch /brake steering system, controlled differential steering system and planetary steering system. BRAKES: Types of brakes like, disc brake, engine brakes etc.

Unit V: **(08 Hrs)** Types of maintenance schedules purpose and advantages, organization set ups, documentation. Safety methods for earth moving equipment's.

1) Unit VI: **(10 Hrs)** Selection of machines
2) Basic rules of equipment's including the nature of operation
3) Selection based on type of soil
4) Selection based on haul distance
5) Selection based on weather condition

Books Recommended: (List of Minimum 5 Books)

1. Diesel equipment- volume I and II by Erich J.schulz
2. Construction equipment and its management By S.C. Sharma

3.Farm machinery and mechanism by Donald R. hunt and L. W.garner

4.Theory of ground vehicles by J.Y.Wong john wiley and sons

5.Moving the earth by Herbert Nicholas

6.On and with the earth by Jagman Singh, W.Newman and Co. culkatta

Note: (If any - such as

(1. In theory examination, the weightage to numerical problems should not exceed 30%.

2. Students can use scientific calculators in theory examination.)

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Skill Enhancement Courses (SEC– F-I)

Paper Title: Automotive Electronics Lab

Paper No: P61 **Credits: 02**

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. Logic Gates

2. Interfacing A/D converter

3. Interfacing Stepper motor control

4. Micro controller programming

5. battery charging system and battery ignition system

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

1. Study of rectifier and filters, Characteristics of amplifiers,
2. Study of Logic Gates, Adder and Flip-Flops,
3. Study of SCR and IC timer, D/A and A/D converter,
4. Study of Assembly language programming exercise,
5. Study of Interfacing A/D converter and simple data acquisition,
6. Study of Interfacing Stepper motor control and CRT terminal,
7. Study of Micro controller programming and interfacing,
8. Study of battery charging system and setting of regulators and out.
9. Study of battery ignition system
10. Study of microprocessor

Student Instructions:

1. Carry your own lab manual.

2. Four to five experiments shall be selected for practical examination.

Laboratory Requirements:

1. **Electronics Lab**

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Skill Enhancement Courses (SEC– F-II)

Paper Title: Tractor and Farm Equipment Lab

Paper No: P62 **Credits: 02**

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. Brake system of a tractor

2. Working of planters

3. Different types of gear box

4. Weeding equipment's and their use

5. Working of rotavator

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

Introduction to transmission systems and components.
1.Study of different types of gear box and calculation of speed ratios.
2. Study on differential and final drive of a tractor.
3. Study of advances in tractor systems and controls.
4. Introduction to various farm machines and visit to implement's shed.
5. Study of rotary duster. And Working of planters.
6.Construction and working of rotavator.
7.Field capacity and field efficiency measurement of tillage and planting equipment.
8.Draft & fuel consumption measurement of different implements.
9.Working of seed-cum-fertilizer drill and its calibration.
10. Weeding equipment's and their use.

Student Instructions:

1. Carry your own lab manual.

2. Four to five experiments shall be selected for practical examination.

Laboratory Requirements:

1. **Farm Equipment Lab**

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Skill Enhancement Courses (SEC– F-III)

Paper Title: Automotive Diagnosis Lab

Paper No: P63

Credits: 02

Practical: 4 lectures/week **Total Marks: 50 (Practical)**

--------- **Course Outcomes:** The students will acquire knowledge of

1. Fault diagnosis in electrical ignition system

2. Fault diagnosis of Electric horn system

3. Fault diagnosis of door lock

4. Fault diagnosis of fuel filters

5. Layout of an automobile repair, service and maintenance shop.

Pre requisites Note: (If Any- such as Knowledge of the topics in the theory papers.)

List of Practicals: (Minimum 10)

1.Study and layout of an automobile repair, service and maintenance shop
2.Study and preparation of the list of different types of tools and instruments required Minorand major tune up of gasoline and diesel engines
3.Study and fault diagnosis in electrical ignition system of gasoline fuel system
4.Study and fault diagnosis in diesel fuelsystem and rectification
5.Study and fault diagnosis of faults in the electrical systems such as Head lights, Side ofParking lights, Traffic indicator lights.
6.Study and fault diagnosis of Electric horn system
7.Study and fault diagnosis of Windscreen wiper system.
8.Study and fault diagnosis of starter system and charging system
9.Study and fault diagnosis of fuel filters (both gasoline and diesel engines) and air cleaners(dry and wet)
10.Study and fault diagnosis of door lock and window glass rising mechanisms

Student Instructions:

1. Carry your own lab manual.

2. Four to five experiments shall be selected for practical examination.

Laboratory Requirements:

1.Diagnosis Lab

Nature of Practical Question Paper: Practical (40) + Theory (10).

Bachelor of Vocation (B. Voc.) Part III - Sem. VI (Degree)

Skill Enhancement Courses (SEC– F-IV)

Paper Title: Project- II

Paper No: P64 **Credits: 02**

Term Work: 2 lectures/week **Total Marks: 50(Internal)**

--------- 1. To provide an opportunity to students do work independently on a topic/ problem/ experimentation selected by them and encourage them to think independently on their own to bring out the conclusion under the given circumstances of the curriculum period in the budget provided with the guidance of the teachers.

2. To encourage creative thinking process to help them to get confidence by planning and carrying out the work plan of the project and to successfully complete the same, through observations, discussions and decision making process.

3. Project Load: Maximum 9-10 students in one batch, involving 03 groups Maximum 9-10 students shall work under one Faculty Member Group of one student is not allowed under any circumstances.

4. Project Definition: Project work shall be based on any of the following:

1. Fabrication of product/ testing setup of an experimentation unit/ apparatus/ small equipment, in a group.

2. Experimental verification of principles used in Mechanical Engineering Applications.

3. Projects having valid database, data flow, algorithm, and output reports, preferably software based.

Project Term Work: The term work under project submitted by students shall include and assessment of Term work should be as below

1 Work Diary: 25 Marks Work Diary maintained by group and countersigned by the guide weekly. The contents of work diary shall reflect the efforts taken by project group for

1. Searching suitable project work

2. Brief report preferably on journals/ research or conference papers/ books or literature

surveyed to select and bring out the project.

3. Brief report of feasibility studies carried to implement the conclusion.

4. Rough Sketches/ Design Calculations, etc.

PROJECT REPORT FORMAT

Project Report:

Project report should be of 60 to 70 pages. For standardization of the project reports the following format should be strictly followed.

1 Page size: Trimmed A4

2. Top Margin: 1.00 Inches

3. Bottom Margin: 1.32 Inches

4. Left Margin: 1.5 Inches

5. Right Margin: 1.0 Inches

6. Para Text: Times New Roman 12 point font

7. Line Spacing: 1.5 Lines

8. Page Numbers: Right aligned at footer.

Font 12 point Times New Roman Headings: New Times Roman, 14 point, Boldface 10.

Certificate: All students should attach standard format of Certificate as described by the Department. Certificate should be awarded to batch and not individual student Certificate should have signatures of Guide, Principal, and External Examiner.

Entire Report has to be documented as one chapter.

11 Index of Report: i) Title Sheet ii) Certificate iii) Acknowledgement iv) Table of Contents v)Synopsis vi) List of Figures vii) List of Photographs/ Plates viii)List of Tables

1. Introduction

2. Literature Survey/ Theory

3. Design/ Experimentation/ Fabrication/ Production/ Actual work carried out for the same. 4. Observation Results

5. Discussion on Results and Conclusion

12 References: References should have the following format For Books:

“Title of Book”; Authors; Publisher; Edition; For Papers: “Title of Paper”; Authors; Conference Details; Year.

Presentation: On the Basis of Continuous assessment

A) The group has to make a presentation before the faculties of department

Date: 20.05.2024

To,

The Registrar

Shivaji University, Kolhapur

Subject: **Submission of B. Voc. - III Year Degree structure as per NEP guidelines**

Dear Sir,

I'm submitting herewith First Year **Bachelor of Vocation (B. Voc.) – Degree** Course structure (LEVEL-7) to be implemented from Academic Year 2024-25.

Kindly accept it and Acknowledge.

Thanking You

Yours Faithfully

(BOS Chairman- IDS)