

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY



CIRCULAR NO.SU/Sci.& Tech./B.Voc./33/2018

It is hereby inform to all concerned that, on the recommendation of the Dean, Faculty of Science & Technology, the Hon'ble Vice-Chancellor has accepted the **following curriculum under B.Voc. programme viz: Certificate, Diploma, Advanced Diploma and B.Voc. Degree** in his emergency powers under section 12(7) of the Maharashtra Public Universities Act, 2016 on behalf of the Academic Council as appended herewith:

1.	B.Voc. Industrial Automation,
2.	B.Voc. Automobile Technology,
3.	B.Voc. Farm Equipment and Machinery,
4.	B.Voc. I.T.Skills and Software Development,
5.	B.Voc. Architectural Planning and Interior Design,
6.	B.Voc. Dairy Products,
7.	B.Voc. Drill Technology,
8.	B.Voc. Plant Tissue Culture and Green House Technology,
9.	B.Voc. Renewable Energy Source,
10.	B.Voc. Computer Hardware & Networking Maintenance.
11.	B.Voc.Food Processing and Preservation.
12.	B.Voc. Sustainable Agriculture.
13.	B.Voc. Bioproducts technician

This is effective from the Academic Year 2018-2019 and onwards.

This curriculum are also available on the university website
www.bamu.ac.in

All concerned are requested to note the contents of this circular and bring notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
Ref.No.
SU/B.Voc/2018/21709-22148
Date:- 12-12-2018

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Deputy Registrar,
Syllabus Section.

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Copy forwarded with compliments to :-

- 1] **The Principals, affiliated concerned Colleges,
Dr. Babasaheb Ambedkar Marathwada University.**
- 2] **The Director, University Network & Information Centre, UNIC,
with a request to upload this Circular on University Website.**

Copy to :-

- 1] The Director, Board of Examinations & Evaluation, Dr.BAMU,A'bad.
- 2] The Section Officer, [BCS Unit] Examination Branch,
- 3] The Section officer, [Eligibility Unit], Dr.BAMU,A'bad.
- 4] The Programmer [Computer Unit-1] Examinations, Dr.BAMU,A'bad.
- 5] The Programmer [Computer Unit-2] Examinations, Dr.BAMU,A'bad.
- 6] The In-charge, [E-Suvidha Kendra], Rajarshi Shahu Maharaj
Pariksha Bhavan, Dr. Babasaheb Ambekar Marathwada University.
- 7] The Public Relation Officer, Dr.BAMU,A'bad.
- 8] The Record Keeper. Dr.BAMU,A'bad.

**DR. BABASAHEB AMBEDKAR
MARATHWADA UNIVERSITY,
AURANGABAD.**



**Curriculum of
B.Voc. Automobile Technology/
Industrial Automation/
Farm Equipment & Machinery.
Choice Based & Credit System**

UNDER THE FACULTY OF SCIENCE & TECHNOLOGY.

[Effective from 2018-19 & onwards]

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD {MS}

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – I)

(Automobile Technology/Industrial Automation/Farm Equipment & Machinery)

SEMESTER – I				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
BV101	Workshop Technology I	3	3	15	60	75
BV102	Engineering Graphics I	3	3	15	60	75
BV103	Basic Electronics	3	3	15	60	75
BV104	Lab - Workshop Technology I	3	6	25	25	50
BV105	Lab - Engineering Graphics I	3	6	25	25	50
BV106	Lab-Basic Electronics	3	6	25	25	50
General Education Components						
BV107	Communication Skills I	4	4	20	80	100
BV108	Computer Fundamental I	4	4	20	80	100
BV109	Lab- Communication Skills I	2	4	25	25	50
BV110	Lab - Computer Fundamental I	2	4	25	25	50
		30	43	210	465	675

Note : The minimum percentage for passing for each course code, practical examination and ESE is 40 %, failing which he/she will get F grade for that course code.

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD {MS}

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – II)

(Automobile Technology / Industrial Automation / Farm Equipment & Machinery)

SEMESTER – II				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
BV201	Workshop Technology II	3	3	15	60	75
BV202	Engineering Graphics II	3	3	15	60	75
BV203	Electrical Technology	3	3	15	60	75
BV204	Lab - Workshop Technology II	3	6	25	25	50
BV205	Lab - Engineering Graphics II	3	6	25	25	50
BV206	Lab-Electrical Technology	3	6	25	25	50
General Education Components						
BV207	Communication Skills II	4	4	20	80	100
BV208	Computer Fundamental II	4	4	20	80	100
BV209	Lab- Communication Skills II	2	4	25	25	50
BV210	Lab - Computer Fundamental II	2	4	25	25	50
		30	43	210	465	675

Note : The minimum percentage for passing for each course code, practical examination and ESE is 40 %, failing which he/she will get F grade for that course code.

Program Objectives

The Bachelor of Vocational (Automobile Technology / Industrial Automation / Farm Equipment & Machinery) has the following general program goals:

1. To provide a thorough education in the fundamentals of vocational training so students can enter into engineering practice, obtain professional registration if desired, and/or enter into graduate study.
2. To provide engineering and liberal arts students with an appreciation of the important role of engineering as a fundamental human endeavor.
3. To promote the involvement of undergraduate students in scholarly research with faculty.
4. To promote an appreciation of cultural diversity and the international nature of the engineering practice through terms abroad and international terms in industry.
5. To guide and advise students by providing individual academic counseling and promoting discourse among students, faculty, alumni and engineering professionals.
6. To encourage enrichment of the educational experience through a variety of extracurricular professional activities.
7. To develop and use the best educational methods and maintain modern teaching and research facilities.

Program Outcomes

The Bachelor of Vocational (Automobile Technology / Industrial Automation / Farm Equipment & Machinery) graduates should be able to demonstrate the following knowledge, skills, abilities, and attitudes at the time of graduation:

1. an ability to apply knowledge of mathematics, science, and engineering
2. an ability to design and conduct experiments, as well as to analyze and interpret data
3. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4. an ability to function on multidisciplinary teams
5. an ability to identify, formulate, and solve engineering problems
6. an understanding of professional and ethical responsibility
7. an ability to communicate effectively
8. a recognition of the need for, and an ability to engage in life-long learning

9. A knowledge of contemporary issues
10. An ability to use the techniques, skills, and modern engineering tools necessary for professional practice.

Eligibility criteria for Admission:

1. A candidate will be eligible to join 1st semester of B. Voc. Automobile Technology / Industrial Automation / Farm Equipment & Machinery course, if he/she has passed 10+2 examination (Arts/Commerce/Science Stream)

Or

2. Passed 10+2 vocational related to any stream of recognized Board/university, or any other examination recognized as equivalent there to.

Or

3. Passed Two Year ITI(Any Stream) or One year ITI(Any Stream) + One year NCTVT (National Council on Vocational Training)
4. The course of study of B. Voc. shall be divided in to six semesters and university examination will be held at the end of every semester in the months of November/December (for semester I, III & V) and May/June (for semester II, IV & VI) or as fixed by the University.
5. Semester examination will be open to regular candidates who have been on the rolls of a college affiliated to this University and meet the attendance and other requirements.

Attendance

Students must have 75 % of attendance in each course for appearing examination otherwise he / she will not be strictly allowed for appearing the examination of each course. However, students having 65 % attendance may request Head of the concerned Institution for the Condonance of attendance on medical ground.

Evaluation Methods

The assessment will be based on Continuous Internal Assessment (CIA) and semester end examination (SEE).

There shall Continuous Internal Assessment for each theory paper. In each semester, 20% (i.e. 15 or 20) marks shall be for CIA and 80% (i.e. 60 or 80) marks for ESE. Marks obtained by the student in all heads viz. CIA and ESE shall be added while declaring the final result.

Continuous Internal Assessment (CIA):- The internal marks shall be assigned on the basis of tutorials/home assignment/seminar presentation and weekly tests/class test/ preliminary examination to be conducted by the concerned college. These marks shall be communicated to the University before commencement of semester end examination.

End Semester Examination (ESE):

- The end semester examination for each theory and practical paper shall be conducted by the University at the end of each semester.
- Duration of theory examination shall be of three hours for a paper of 80 marks and two hour for a paper of 60/40marks. Practical examinations shall be of three hour duration for every semester end examinations respectively.
- The respective college is advised to arrange maximum number of experiments from the list of experiments provided with the syllabus or experiments based on theory syllabus.
- Assessment of laboratory courses and project will also have 50 % internal and 50 % semester end assessment. Semester end practical examination will be of 25 marks and 25 marks will be for internal examination. Student must perform at least eight experiments from each laboratory course. The semester end practical examination will be conducted at the end of each semester along with the theory examination.
- Students without certified journal shall not be allowed to appear for the practical examination.

Examination Scheme

- A student shall be evaluated for his/her academic performance in a course through class tests, tutorials, practical's, homework assignments, term papers, field work, seminars, quizzes, Test examinations, teachers assessments and the End-Semester Examination as applicable.
- At the end of the semester, there would be an End Semester Examination as per syllabus. For the examination of First Year for the academic year 2018-2019, the minimum percentage for passing for each course code, practical examination and ESE is 40 %, failing which he/she will get F grade for that course code. This rule will be progressively applicable for higher classes in next consecutive years.

- The project work shall be evaluated by midterm seminar(s), quality of work carried out, project report submission and the viva-voce examinations.
- The industrial/field training shall be evaluated through the quality of work carried out, the report submission and presentation(s).

Rule for combined passing:

- To pass the examination a candidate must obtain minimum 40% of Marks in each End Semester Examination & CIA taken together, however the candidate must obtain minimum 40% of Marks at the End Semester Examination.
- To pass a subject where there is no provision of class test, the candidate must obtain 40% of Marks in the End Semester Examination.
- If the candidate remains absent for CIA, his performance should be treated as "Zero" Marks.

SKILL DEVELOPMENT COMPONENT

BV101 - WORKSHOP TECHNOLOGY-I

Teaching Scheme(Theory)	Examination Scheme
Credit : 3 Lecture : 3 Hrs/Week Total Count : 45 Hrs/Semester	Internal Assessment: 15 Marks End Semester Exam: 60 Marks (Duration 2.00 hrs) Total Marks : 75 Marks

Course Objective

1. To study skills in basic engineering practice.
2. To understand & identify the hand tools and instruments used in workshop
3. To study & understand measuring skills of different parts.
4. Obtain practical skills in the trades.

Syllabus

1. **Safety and Precautions** 6 Hrs
 - I. Importance of safety and general precautions to be observed in the shop
 - II. Use of fire extinguishers
 - III. Storing and handling of inflammable materials
 - IV. Elementary first aid.
2. **Fitting and Bench Work** 9 Hrs
 - I. Necessity and importance of bench work..
 - II. Description and uses of different had tools like: Holding tools, Striking Tools, Cutting tools, Drilling,
 - III. Boring tapping and dying tools
 - IV. Scrapping tools, Marking tools like surface plates, angle plates, V-blocks Tri-square, scribes etc.
3. **Metrology** 9 Hrs
 - I. Introduction, concepts of measurements,
 - II. measuring instruments such as scale, vernier, micrometer, depth gauge,
 - III. bore gauge, filler gauge,

IV. screw gauge, divider, caliber, dial gauge,

V. Compression gauge, vacuum gauge.

4. Manufacturing Process

8 Hrs

I. Introduction, different types of manufacturing process

II. casting, welding, forging,

III. cold rolling, hot rolling,

IV. Machining, fabricating etc.

5. Welding

8 Hrs

I. Introduction, types of welding

II. Arc welding, gas welding,

III. Termite welding etc.

IV. Soldering and brazing.

6. Sheet metal work

5 Hrs

I. Introduction, metals used in sheet metal work,

II. sheet metal hand tools

III. sheet metal operation

IV. sheet metal joints

V. Sheet metal working machines.

Reference Books

1. Workshop Technology – Vol. – I and II – By Hajra and Choudhary

2. Production Technology – R.K. Jain

3. Workshop Technology – Vol. I and II – By Raghuwanshi

4. Workshop Technology – By Chapman

Course Outcomes

After successful completion of the course, the students shall be able to

- Acquire skills in basic engineering practice.

- Identify the hand tools and instruments.
- Gain measuring skills.
- Obtain practical skills in the trades.

Bachelor of Vocational

BV102 - ENGINEERING GRAPHICS I

Teaching Scheme(Theory)	Examination Scheme
Credit : 3 Lecture : 3 Hrs/Week Total Count : 45 Hrs/Semester	Internal Assessment: 15 Marks End Semester Exam: 60 Marks (Duration 2.00 hrs) Total Marks : 75 Marks

Course objectives

- I. To enable students to acquire and use engineering drawing skills as a means of accurately and clearly communicating ideas, information and instructions.
- II. To enable students to acquire requisite knowledge, techniques and attitude required for advanced study of engineering drawing

Syllabus

1. Drawing standard

10 Hrs

- III. Drawing standard SP46
- IV. Dimensioning, Lettering
- V. Type of lines
- VI. Scaling conventions

2. Geometrical constructions

12 Hrs

- I. Dividing a given straight line into any number of equal parts
- II. bisecting a given angle
- III. drawing a regular polygon given one side
- IV. special methods of constructing a pentagon and a hexagon

3. Orthographic Projections

10 Hrs

- I. Introduction to orthographic projection,
- II. drawing orthographic views of objects from their isometric views -Orthographic projections of Points lying in four quarters,
- III. Orthographic projection of lines parallel and inclined to one or both planes.

4. Isometric projection

10 Hrs

- I. Introduction
- II. Drawing of Isometric scale distinction between Isometric drawing and Isometric projections,
- III. Isometric Drawing of a rectangle, hexagon and pentagon, circle an arc,
- IV. Isometric drawing and sketching of simple machine Components.

Text Books:

1. N.D. Bhatt, Elementary Engineering Drawing, Chartor Publishing house, Anand, India.
2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd..

Reference Books :

1. P.S. Gill, Engineering Graphics.
2. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.
3. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.
4. Fredderock E. Giesecke, Alva Mitchell & others, Principles of Engineering Graphics, Maxwell McMillan Publishing

Courses outcomes

- The students should be proficient in using engineering drawing apparatus, materials and techniques
- Students should be able to use and interpret standard conventions used in engineering drawing

BV103-ELECTRICAL TECHNOLOGY

Teaching Scheme	Examination Scheme
Credit : 3 Lecture : 3 Hrs/Week Total Count : 45 Hrs/Semester	Internal Assessment: 15 Marks End Semester Exam: 60 Marks (Duration 2.00 hrs) Total Marks : 75 Marks

Course Objective:

1. To provide comprehensive idea about AC and D C circuit analysis, working principles and applications of basic machines in electrical engineering.
2. Maintain and improve their technical competence through lifelong learning, including entering and succeeding in an advanced degree program in a field such as engineering, science, or business.

Syllabus

1. D.C. circuit analysis and network theorems 6 Hrs

- I. Circuit concepts: Concept of network, Active and passive elements, voltage and current sources
- II. concept of linearity and linear network, unilateral and bilateral elements, R L and C as linear elements, source transformation,
- III. Ohm's Law, Voltage divider rule, Kirchoff's Law:
- IV. loop and nodal methods of analysis, star delta transformation,
- V. Network theorems: Thevenin's theorem, Norton's theorem, maximum power transfer theorem. (8)

2. Steady state analysis of single phase ac circuits 7 Hrs

- I. AC fundamentals: Sinusoidal, square and triangular waveforms-average and effective value, form the peak factors,
- II. concept of phasors, phasors representation of sinusoidally varying voltage and current,
- III. Analysis of series-parallel RLC circuits. Apparent, active and reactive powers, power factor,
- IV. Causes and problems of low power factor, power factor improvement, resonance in series and parallel circuits, bandwidth and quality factors.

3. Three phase ac circuits 5 Hrs

- I. Three phase system: Its necessity and advantages,
- II. Meaning of phase sequence,
- III. Star and delta connections, balanced supply and balanced load,
- IV. Line and phase voltage/current relation, three phase power measurements.

4. Measurement instruments

8 Hrs

- I. Types of instruments: construction and working principle of PMMC and MI type voltmeter and ammeters,
- II. single phase dynamometer type wattmeter and induction type energy meter,
- III. use of shunts and multipliers.

5. Introduction of power system:

4 Hrs

- I. General layout of electrical power system and function of its elements,
- II. standard transmission and distribution voltages, Concept of grid.

6. Magnetic circuit

8 Hrs

- I. Concepts, analogy between electric and magnetic circuit, magnetic circuits with DC and AC excitation,
- II. Magnetic leakage, BH curve, hysteresis and eddy current losses, magnetic circuit calculation, mutual coupling.
- III. Single Phase Transformer: Principle of operation, construction, EMF equation, equivalent circuit, power losses, efficiency, Introduction to auto transformers.

7. Principle of Electromechanical energy conversion

7 Hrs

- I. DC Machines: Types, emf equation of generator and torque equation of motor, characteristics and applications of DC motors.
- II. Three Phase Induction Motor: Type, principle of operation, slip-torque Characteristics, applications.
- III. Single Phase Induction Motor: Principle of operation and introduction to methods of starting, applications.
- IV. Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor, applications.

References:

1. B.L. Threja "Electrical Technology Vol 1 & 2.
2. V.Deltoro, "Principle of Electrical Engg." PHI.
3. M.A Mallick, Dr. I. Ashraf, "Fundamental of Electrical Engg," Word Press, Lucknow.
4. "Basic Electrical Engg" Dhanpat Rai & sons.

5. I J Nagrath, "Basic Electrical Engg", TMH

Course Outcome:

1. To understand the basic concepts of magnetic circuits, electro magnetism and electrostatics.
2. To understand and analyses AC & DC circuits.
3. To understand the working principle, and applications of DC & AC machines.

Bachelor of Vocational

BV 104- LAB WORKSHOP TECHNOLOGY-I

Teaching Scheme (Practical)	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

List of Experiments

- 1 To study and draw sketches of marking tools.
- 2 To Study and draw sketches of measuring tools.
- 3 To draw sketches of different types spanners.
- 4 To conduct exercise on filing, cutting, scraping and chipping on two jobs each.
- 5 To conduct exercise on drilling and tapping on any two job.
- 6 To conduct exercise on external threading by using dies
- 7 To draw neat sketch of bench grinder.
- 8 To conduct exercise on arc welding and gas welding.
- 9 To prepare male and female part in fitting shop.
- 10 To study and draw various types of hand tools.
- 11 One Industrial Visit

BV105 – LAB ENGINEERING GRAPHICS I

Teaching Scheme(Practical)	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks End Semester Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

List of Practical:

1. One Sheet on Lines, lettering and dimensioning.
2. Two Sheet on Geometrical Constructions
3. Two Sheet on Orthographic projections
4. One Sheet Projections of straight lines.
5. Two Sheet on Isometric Projections.

BV106-LAB ELECTRICAL TECHNOLOGY

Teaching Scheme	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

List of Experiments:

1. Mesh and nodal analysis
2. Verification of Thevenin's Theorem.
3. Verification of Superposition Theorem.
4. Verification of Maximum Power Transfer Theorem.
5. Study of R-L series and R-C series circuit
6. To study the phenomenon of resonance in series RLC circuit.
8. R-L- -C parallel resonance circuit
9. Relationship between phase and line currents and voltages in 3- phase system (Star-Deltas)
10. Power and phase measurements in three phase system by two wattmeter method
11. OC and SC test on single phase transformer
12. Determination of losses in single phase transformer by OCT and SCT.
13. To calibrate a single phase induction type energy meter.

GENERAL EDUCATION COMPONENT

BV107 - COMMUNICATION SKILLS I

Teaching Scheme (Theory)	Examination Scheme
Credit : 4 Lecture : 4 Hrs/Week Total Count : 60 Hrs/Semester	Internal Assessment: 20 Marks End Semester Exam: 80 Marks (Duration 3.00 hrs) Total Marks : 100 Marks

Course Objectives

1. To understand techniques of effective communication.
2. To make aware about barriers to communication with ethical context.
3. To understand the process of e-mail communication & minutes of meeting.
4. To understand the concept and structure of report writing.
5. To develop & improve various skills like communication, reading, listing, note making, persuasive speaking, body language & gestures.

1. Concept of Communication

9 Hrs.

- I. Importance of Communication
- II. Process of communication
- III. Feedback

2. Objective of communication

10 Hrs

- I. Upward communication,
- II. Downward Communication
- III. Horizontal Communication

3. Method of Communication

10 Hrs

- I. Verbal Communication
- II. Oral Communication
- III. Written Communication

4. Written Communication

18 Hrs

- I. Punctuation Marks, Capitals, Abbreviations,
- II. Grammar: Parts of speech,
- III. Tenses, Vocabulary Building,
- IV. Cs of good communication,
- V. Language of business Writing

5. Unit V: Oral Communication

13 Hrs

- I. Speeches and Presentation

II. Dialogue

III. Phonetics

Reference Books

1. Business Communication: Urmila Rai & S.M. Rai
2. Communication Skill For Effective Management: Dr. Anjali Ghanekar
3. Developing Communication Skill by Krishna Mohan, Meera Banerjee

Course Outcomes

1. After conclusion of study the students will be able to:
2. 1. To make effective and impressive communication.
3. 2. To make communication in ethical manner.
4. 3. Capable to make persuasive digital communication.
5. 4. Capable to make abstract & summaries of proposals.
6. 5. Better presentation and communication using proper body language

BV108 - COMPUTER FUNDAMENTAL I

Teaching Scheme	Examination Scheme
Credit : 4 Lecture : 4 Hrs/Week Total Count : 60 Hrs/Semester	Internal Assessment: 20 Marks End Semester Exam: 80 Marks (Duration 3.00 hrs) Total Marks : 100 Marks

Course Objective

1. Understand the meaning and basic components of a computer system.
2. To learn generation, classification and application of computers.
3. Knowledge of computer equipment, including both hardware and software.
4. To learn input devices and output devices in detail.
5. Introduced students to information, its need, use, characteristics and level of information.
6. Use software (MS-Word) to solve basic information systems problems.

Syllabus

1. Knowing computer

15 Hrs

- I. Introduction of Computer
- II. Basic Applications of Computer
- III. Components of Computer System : Input & Output Devices
- IV. Concept of Hardware and Software
- V. Hardware & Software
- VI. Concept of computing, data and information
- VII. Concept of Internet, World Wide Web (WWW), Popular Search Engines / Search for content
- VIII. Applications of IECT : e-governance, Entertainment
- IX. Mobile Banking

2. Computer Generation and Classification

12 Hrs

- I. Generation of Computers
- II. Classification of Computers
- III. Mini, Super-mini, midi, maxi computer.
- IV. Distributed & Parallel Computers

3. Operating system

13 Hrs

- I. Introduction
- II. Definition, Need, Functions

- III. Types of Operating System : LINUX, WINDOWS
- IV. The User Interface : Task Bar, Icons, Menu , Running an Application
- V. Operating System Simple Setting : Changing System Date And Time, Changing Display Properties, To Add Or Remove A Windows Component , Adding and removing Printers
- VI. File and Directory Management Creating and renaming of files and directories

4. Understanding Word Processing

20 Hrs

- I. Introduction
- II. Word Processing Basics : Menu Bar
- III. Opening and closing Documents : Save and Save as, Page Setup, Printing of Documents
- IV. Text Creation and manipulation : Document Creation, Editing Text , Text Selection, Cut, Copy and Paste, Spell check, Thesaurus,
- V. Formatting the Text : Font and Size selection, Alignment of Text, Paragraph Indenting, Bullets and Numbering, Changing case
- VI. Table Manipulation : Draw Table, Changing cell width and height, Alignment of Text in cell, Delete / Insertion of row and column , Border and shading

Reference Books

- 1. Fundamental of Information Technology by Chetan Shrivastava (Kalyani Publication)
- 2. Fundamental of Computer by V. Rajaram (PHI. Publication)
- 3. Fundamental of Programming by R.K.Jain (S.Chand)
- 4. Microsoft Office 2016 Word, Excel, One Note Book - Vol 1 by Lalit Mali

Course Outcomes

After the completion of the course, Students will be able to

- 1. Understand the concept of input and output devices of Computers and how it works.
- 2. Understand the concepts, structure, types and design of operating Systems.
- 3. Understand the concept of Data Communication, its Modes, its Forms and Data Communication Channels.
- 4. Understand evolution of internet, its application and its basic services.
- 5. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
- 6. Create and design a word document for general office use.

BV 109 - LAB COMMUNICATION SKILLS I

Teaching Scheme (Practical)	Examination Scheme
Credit : 2 Practical : 4 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

Lab Assessments

1. Listening Comprehension : Listening & Typing
2. Listening Comprehension : Listening & Sequencing of Sentences
3. Reading Comprehension & Vocabulary : Fill in the Blanks
4. Reading Comprehension & Vocabulary : Cloze Exercises
5. Reading Comprehension & Vocabulary : Vocabulary Buildings
6. Reading Comprehension & Vocabulary : Reading & Answering Questions
7. Speaking : Intonation & Ear Training
8. Speaking : Correct Pronunciation & Sound Recognition
9. Speaking : Face to Face Conversation
10. Speaking : Telephone Conversation

BV 110 - LAB COMPUTER FUNDAMENTAL I

Teaching Scheme (Practical)	Examination Scheme
Credit : 2 Practical : 4 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

List of Experiments

1. To Study Input & Output Devices of Computer System
2. To Study different types of software of Computer System for daily applications
3. To understand different types of web browsers used as a search engines & its applications
4. To Study Applications of IECT : e-governance, Entertainment
5. To Study different generation of Computer
6. Study of the difference between different operating system used in computer system
7. Study of computer windows application & accessories like Notepad, paint, WordPad
8. To Create Word Document and insert Text & Picture
9. To Create Word Document using References, Mailing & Review
10. Create One report using Microsoft word

DR.BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD {MS}

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – II)

(Automobile Technology / Industrial Automation / Farm Equipment & Machinery)

SEMESTER – II				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
BV201	Workshop Technology II	3	3	15	60	75
BV202	Engineering Graphics II	3	3	15	60	75
BV203	Electrical Technology	3	3	15	60	75
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BV205	Lab - Engineering Graphics II	3	6	25	25	50
BV206	Lab-Electrical Technology	3	6	25	25	50
General Education Components						
BV207	Communication Skills II	4	4	20	80	100
BV208	Computer Fundamental II	4	4	20	80	100
BV209	Lab- Communication Skills II	2	4	25	25	50
BV210	Lab - Computer Fundamental II	2	4	25	25	50
		30	43	210	465	675

SKILL DEVELOPMENT COMPONENT

BV201-WORKSHOP TECHNOLOGY-II

Teaching Scheme (Theory)	Examination Scheme
Credit : 3 Lecture : 3 Hrs/Week Total Count : 45 Hrs/Semester	Internal Assessment: 15 Marks End Semester Exam: 60 Marks (Duration 2.00 hrs) Total Marks : 75 Marks

Course Objective

- To study skills in traditional machines used in industry.
- To understand & identify the parts of machine used in workshop
- To study & learned skills of machine operations.
- Obtain practical skills in the trades.

Syllabus

1. Lathe

10 Hrs

- I. Introduction,
- II. Classification, applications,
- III. Construction and working,
- IV. Different types of operations,
- V. Construction details, types of lathe,
- VI. Different operations such as facing, turning, drilling, boring, threading, parting, knurling etc.

2. Drilling machine

7 Hrs

- I. Introduction,
- II. Classification & applications,
- III. construction and operations of different types of drilling machine
- IV. Advantages & Disadvantages

3. Grinding machine

8 Hrs

- I. Introduction
- II. Classification & applications

III. Construction and operations of different types of Grinding machine

IV. Advantages & Disadvantages

4. Machine Tools

12 Hrs

I. Introduction,

II. Basic concepts,

III. Construction and working of different types of machines such as shaper, slotter, planner, miller etc.

5. CNC machine

8 Hrs

I. Introduction,

II. Basic components

III. Construction Working CNC machine

IV. Types & Application of CNC Machine

Reference Books

1. Workshop Technology – Vol.II – By Hajra and Choudhary

2. Production Technology – R.K. Jain

3. Workshop Technology – Vol II – By Raghuwanshi

4. Workshop Technology – By Chapman

Course Outcomes

After successful completion of the course, the students shall be able to

1. Skills in traditional machines used in industry.

2. identify the parts of machine used in workshop

3. Learned skills of machine operations.

4. Obtain practical skills in the trades.

BV202 - ENGINEERING GRAPHICS II

Teaching Scheme (Theory)	Examination Scheme
Credit : 3 Lecture : 3 Hrs/Week Total Count : 45 Hrs/Semester	Internal Assessment: 15 Marks End Semester Exam: 60 Marks (Duration 2.00 hrs) Total Marks : 75 Marks

Course objectives

- I. To enable students to acquire and use engineering drawing skills as a means of accurately and clearly communicating ideas, information and instructions.
- II. To enable students to acquire requisite knowledge, techniques and attitude required for advanced study of engineering drawing

Syllabus

1. Solids and sectioning

15 Hrs

- I. Types of solids,
- II. Projections of solids with axis perpendicular to HP,
- III. solids with axis perpendicular to VP,
- IV. Solids with axis inclined to one plane.
- V. Projection of spheres touching each other Sectioning of solids:
- VI. Section planes perpendicular to one plane and parallel or inclined to other plane.

2: Studies of surfaces

15 Hrs

- I. Intersection of surfaces: intersection of cylinder and cylinder
- II. Intersection of cylinder and cone
- III. Intersection of prisms
- IV. Development of surfaces: Development of cylindrical and conical surfaces
- V. Development of prisms

3. Computer aided drafting

15 Hrs

- I. Introduction to computer aided drafting: introduction to computer aided drafting package to make drawings
- II. Coordinate System
- III. Status bar
- IV. Draw Toolbar
- V. Modify Toolbar
- VI. Dimensioning

Text Books :

1. N.D. Bhatt, Elementary Engineering Drawing, Chartor Publishing house, Anand, India.
2. D. N. Johle, Engineering Drawing, Tata Mcgraw-hill Publishing Co. Ltd.

Reference Books :

1. P.S. Gill, Engineering Graphics.
2. N.D. Bhatt, Machine Drawing, Chartor Publishing house, Anand, India.
3. Warren J. Luzzader, Fundamentals of Engineering Drawing, Prentice Hall of India, New Delhi.

Courses outcomes

- The students should be proficient in using engineering drawing apparatus, materials and techniques
- Students should be able to use and interpret standard conventions used in engineering drawing

BV203 - BASIC ELECTRONICS

Teaching Scheme (Theory)	Examination Scheme
Credit : 3	Internal Assessment: 15 Marks
Lecture : 3 Hrs/Week	End Semester Exam: 60 Marks (Duration 2.00 hrs)
Total Count : 45 Hrs/Semester	Total Marks : 75 Marks

Course Objectives

1. To be exposed to the characteristics of basic electronic devices.
2. Maintain and improve their technical competence through lifelong learning, including entering and succeeding in an advanced degree program in a field such as engineering, science, or business.

1. Basic Electronics Components 6Hrs

- I. Resistors & Types of resistors, Construction and color coding
- II. Capacitor, Types of Capacitor and, their construction,
- III. Inductor & their types

2. Semiconductor Devices 10Hrs

- I. Introduction to semiconductors: Concept of energy band diagram (Conductor, Semiconductor, Insulator) ,
- II. Intrinsic and extrinsic semiconductor (P type, N type), diffusion junction, depletion layer,
- III. Barrier potential P-N Junction diode forward and reverse bias characteristics of diode Zener diode LED,
- IV. Photodiode,
- V. Phototransistor,
- VI. LED, Variator Diode, working and characteristics.

3. Transistors 12Hrs

- I. BJT, working, characteristics, configuration (CE, CB, CC), α and β relation between α and β ,
- II. FET- working and characteristics, parameters,
- III. MOSFET- Working and characteristics, UJT- working and characteristics.
- IV. Why Bias a Transistor, Selection of Operating Point, Need for Bias Stabilization, Requirement of a Biasing Circuit,
- V. Different Biasing Circuits, Fixed-Bias Circuit,
- VI. Collector-to-base Bias Circuit, voltage bias,

4. Power Supply Fundamentals 12Hrs

- I. Power supply building blocks,
- II. Rectifier, Need of rectifier, Types of Rectifier,
- III. Filter and their types,
- IV. Voltage doubler, voltage multiplier.
- V. SMPS Power Supply ,

- VI.** Regulated power supply- shunt regulator, series regulator, Transistorized voltage regulator, Three terminal voltage regulator such as IC 78XX & IC 79XX
Adjustable voltage regulator using LM-317

Reference Books-

1. Electronic and Radio Engg. – N.D. Gupta,
2. Basic Electronics – Malvino
3. A textbook of Applied Electronics – R.S. Sedha – S.Chand and Co. Ltd. New Delhi.

Course outcome

1. This course gives an overview of various semiconductor devices
2. Learn the characteristics of basic electronic devices.
3. Learn the Characteristics of UJT
4. Learn the Characteristics of FET
5. Learn about Power amplifiers.
6. At the end of this course, the students will be able to analyze and design amplifier circuits, oscillators and filter circuits employing BJT, FET devices.

BV204 - LAB WORKSHOP TECHNOLOGY II

Teaching Scheme(Practical)	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

Lab Experiment

1. Draw a neat sketch of lathe machine used in workshop.
2. Demonstration and study of Drilling Machine
3. To conduct two exercises on drilling operation.
4. Demonstration and study of Milling Machine
5. Demonstration and study of shaper Machine
6. Demonstration and study of Grinding Machine
7. To conduct exercise on grinding machine.
8. To prepare a job on lathe machine which consist facing, plain and step turning, taper turning and threading.
9. To prepare a job on lathe machine which consist facing, chamfering, grooving, Knurling. Under cutting.
10. Demonstration and study of CNC Machine
11. One Industrial Visit

BV205 – LAB ENGINEERING GRAPHICS II

Teaching Scheme(Practical)	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

List of Practical:

1. One Sheet on Types of Solid
2. One Sheet on Solid solids with axis perpendicular to VP
3. Section planes perpendicular to one plane and parallel or inclined to other plane Sheet
4. Sheet on intersection of cylinder and cylinder & Cylinder and Cone, Prism
5. Development of cylindrical and conical surfaces, Prism
6. To study types of Status Toolbar in CAD
7. To study types of Draw Tools in CAD
8. To study types of Modify Tools in CAD
9. To study types of Dimensioning Toolbar in CAD
10. Create One Drawing with the help of AutoCAD Software.

BV206 - LAB BASIC ELECTRONICS

Teaching Scheme(Practical)	Examination Scheme
Credit : 3 Practical : 6 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

Lab Experiments

1. To study characteristics of P-N diode Junction.(Forward bias)
2. To study characteristics Zener diode.(Reverse bias)
3. To study the characteristics of PNP transistor in CB configuration and to evaluate-1 Input resistance 2. Output resistance and current gain.
4. To study the characteristics of NPN transistor in CB and to evaluate-1 Input resistance 2. Output resistance and current gain.
5. To find the Q- point of a bipolar junction transistor
6. To Study of fixed bias arrangement for transistor.
7. To study characteristics of CE configuration of transistor.
8. To study voltage doubler circuit.
9. To study of shunt, series voltage regulator.
10. To study characteristics of CE configuration of transistor.
11. To study of voltage regulator IC-78XX & IC-79XX.
12. Study of Voltage regulator using IC317.

GENERAL EDUCATION COMPONENT

BV 207- COMMUNICATION SKILLS II

Teaching Scheme (Theory)	Examination Scheme
Credit : 4 Lecture : 4 Hrs/Week Total Count : 60 Hrs/Semester	Internal Assessment: 20 Marks End Semester Exam: 80 Marks (Duration 3.00 hrs) Total Marks : 100 Marks

Course Objectives

1. To understand techniques of effective communication.
2. To make aware about barriers to communication with ethical context.
3. To understand the process of e-mail communication & minutes of meeting.
4. To understand the concept and structure of report writing.
5. To develop & improve various skills like communication, reading, listing, note making, persuasive speaking, body language & gestures.

Syllabus

1. **Communication with media** 18 Hrs
 - I. Written Media of Communication:
 - II. Letters, Notices, Minutes, Manual, Leaflets, Complaints and suggestion,
 - III. Job Application
 - IV. Visual media of communication
 - V. Slide Presentations, Pictures & photographs, Posters & Advertisement
 - VI. Non verbal media of communication
2. **Written Communication: Reports** 15 Hrs
 - I. Types of reports, Characteristics of good report
 - II. Essential requisites of good report writing
 - III. Planning the Reports
 - IV. Outlining issues for Analysis, Writing the reports
3. **Group Communication** 13 Hrs
 - I. Problems of group communication,
 - II. Meeting,
 - III. Advantages of meeting,
 - IV. Preparations for meeting,
4. **Interview** 14 Hrs
 - I. Purpose of Interview,

- II. Types of interview,
- III. Employment interview,
- IV. Candidates Preparation,
- V. questions commonly asked in interview,
- VI. Role of interviewer

Reference Books

- 1. Business Communication: Urmila Rai & S.M. Rai
- 2. Communication Skill For Effective Management: Dr. Anjali Ghanekar
- 3. Developing Communication Skill by Krishna Mohan, Meera Banerjee

Course Outcomes

- 1. After conclusion of study the students will be able to:
- 2. To make effective and impressive communication.
- 3. To make communication in ethical manner.
- 4. Capable to make persuasive digital communication.
- 5. Capable to make abstract & summaries of proposals.
- 6. Better presentation and communication using proper body language

BV 208 - COMPUTER FUNDAMENTAL II

Teaching Scheme (Theory)	Examination Scheme
Credit : 4	Internal Assessment: 20 Marks
Lecture : 4 Hrs/Week	End Semester Exam: 80 Marks (Duration 3.00 hrs)
Total Count : 60 Hrs/Semester	Total Marks : 100 Marks

Course Objective

1. To learn generation, classification and application of computers.
2. Knowledge of computer equipment, including both hardware and software.
3. To learn memory and its types in detail.
4. Introduced students to information, its need, use, characteristics and level of information.
5. Use software (MC Excel & MS-PowerPoint) to solve basic information systems problems.

Syllabus

1. **Introduction of computer languages** **8 Hrs**
 - I. Types of programming language: Machine Language, Assembly Language, High Level Language
 - II. Assembler, Linker, Loader, Interpreter, Compiler
2. **Computer memory** **7 Hrs**
 - I. Introduction
 - II. Types of Memory (Primary & Secondary) : RAM, ROM, PROM, EPROM
 - III. Secondary Storage Devices : FD, CD, HD, Pen drive, DVD, DAT
3. **Spread sheet (Excel)** **15 Hrs**
 - I. Introduction : Elements of Spread Sheet,
 - II. Opening of Spread Sheet , Addressing of Cells, Printing of Spread Sheet, Saving Workbooks
 - III. Manipulation of Cells : Entering Text, Numbers and Dates, Creating Text, Number and Date Series,
 - IV. Editing Worksheet Data, Inserting and Deleting Rows, Column, Changing Cell Height and Width,
 - V. Formulas and Function : Using Formulas, Function
4. **PowerPoint presentations** **15 Hrs**
 - I. Basics : Opening & Saving A Presentation
 - II. Creation of Presentation : Use a Template, Blank Presentation, Editing Text
 - III. Inserting And Deleting Slides in a Presentation

- IV. Preparation of Slides : Word Table or An Excel Worksheet Adding, Clip Art & Picture Art, Inserting Other Objects, Resizing and Scaling an Object
- V. Presentation of Slides: Viewing A Presentation
- VI. Choosing a Set Up for Presentation
- VII. Printing Slides And Handouts
- VIII. Slide Show : Running & Transition and Slide Timings

5. Communications and collaboration

15 Hrs

- I. Basics of E-mail : What is an Electronic Mail, Email Addressing, Using E-mails
- II. Opening Email account, Mailbox: Inbox and Outbox
- III. E-mail message : Create, Send, Reply
- IV. Sorting and Searching emails
- V. Document collaboration
- VI. Instant Messaging and Collaboration
- VII. Using Instant messaging
- VIII. Instant messaging providers
- IX. Netiquettes

Reference Books

- 1. Fundamental of Information Technology by Chetan Shrivatstava (Kalyani Publication)
- 2. Fundamental of Computer by V. Rajaram (PHI. Publication)
- 3. Fundamental of Programming by R.K.Jain (S.Chand)
- 4. Microsoft Office 2016 Word, Excel, One Note Book - Vol 1 by Lalit Mali

Course Outcomes

After the completion of the course, Students will be able to

- 1. Understand the concept of input and output devices of Computers and how it works.
- 2. Understand the concepts, structure, types and design of operating Systems.
- 3. Understand the concept of Data Communication, its Modes, its Forms and Data Communication Channels.
- 4. Understand evolution of internet, its application and its basic services.
- 5. Recognize when to use each of the Microsoft Office programs to create professional and academic documents.
- 6. Create and design a word document for general office use.

BV 209 - LAB COMMUNICATION SKILLS II

Teaching Scheme	Examination Scheme
Credit : 2 Practical : 4 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

Lab Assessments

1. Listening Comprehension : Video 1
2. Listening Comprehension : Video 2
3. Listening Comprehension : Video 3
4. Reading Comprehension : Reading with proper pronunciation & Recording Part 1
5. Reading Comprehension : Reading with proper pronunciation & Recording Part 2
6. Speaking : CIFEL Spoken English Exercise Volume 1
7. Speaking : CIFEL Spoken English Exercise Volume 2
8. Speaking : Drilling : Proper pronunciation of Word
9. Speaking : Drilling : Proper pronunciation of Sentence

BV210 - LAB COMPUTER FUNDAMENTAL II

Teaching Scheme	Examination Scheme
Credit : 2 Practical : 4 Hrs/Batch/Week	Internal Assessment: 25 Marks External Exam: 25 Marks (Duration 3.00 hrs) Total Marks : 50 Marks

1. To Study different Elements of Spread Sheet
2. To Study Manipulation of Cells Entering Text, Numbers and Dates, Creating Text, Number and Date Series in Microsoft Excel
3. To Study & apply different Formulas and Function in Microsoft Excel
4. Create One Excel sheet of Result Analysis of Students
5. To Study & apply Creation of Presentation in Microsoft PowerPoint
6. To Study different types of Charts, Table used in Power Point Presentation.
7. To study Presentation of Slides
8. Create One Presentation for College advertisement at global level
9. Create Email ID & Send mail to friends about Wishes
10. Create one Dummy official report for loan purpose; create it PowerPoint presentation with Excel Sheet & Send to Class Teacher.

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Course Structure of S.Y. Bachelor of Vocational (SEMESTER – III)

(Automobile Technology)

SEMESTER – III				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
AT301	Auto Service Technician	3	3	15	60	75
AT302	Auto Tools & Equipments	3	3	15	60	75
AT303	Automobile Engine Technology	3	3	15	60	75
AT304	Lab-Auto Service Technician	3	6	25	25	50
AT305	Lab-Auto Tools & Equipments	3	6	25	25	50
AT306	Lab-Automobile Engine Technology	3	6	25	25	50
General Education Components						
AT307	Industrial Ethics & Safety Management	4	4	20	80	100
AT308	Environment science	4	4	20	80	100
AT309	Lab - Industrial Ethics & Safety Management	2	4	25	25	50
AT310	Lab- Environment Science	2	4	25	25	50
		30	43	210	465	675

Course Structure of S.Y. Bachelor of Vocational (SEMESTER – IV)

(Automobile Technology)

SEMESTER – IV				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
AT401	Two Wheeler Servicing	3	3	15	60	75
AT402	Four Wheeler Servicing	3	3	15	60	75
AT403	Automobile Transmission System	3	3	15	60	75
AT404	Lab-Two Wheeler Servicing	3	6	25	25	50
AT405	Lab-Four Wheeler Servicing	3	6	25	25	50
AT406	Lab-Automobile Transmission System	3	6	25	25	50
General Education Components						
AT407	Business Communication	4	4	20	80	100
AT408	Personality Development	4	4	20	80	100
AT409	Lab-Business Communication	2	4	25	25	50
AT410	Lab-Personality Development	2	4	25	25	50
		30	43	210	465	675

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Course Structure of F.Y. Bachelor of Vocational (SEMESTER – V)

(Automobile Technology)

SEMESTER – V				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
AT501	Electrical & Electronics System	3	3	15	60	75
AT502	Advance Vehicle	3	3	15	60	75
AT503	Transport Management & Rules	3	3	15	60	75
AT504	Lab-Electrical & Electronics System	3	6	25	25	50
AT505	Lab-Advance Vehicle	3	6	25	25	50
AT506	Seminar	3	6	25	25	50
General Education Components						
AT507	Entrepreneurship Development I	4	4	20	80	100
AT508	Quality Engineering & Industrial Management	4	4	20	80	100
AT509	Lab-Entrepreneurship Development I	2	4	25	25	50
AT510	Lab- Quality Engineering & Industrial Management	2	4	25	25	50
		30	43	210	465	675

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – VI)

(Automobile Technology)

SEMESTER – VI				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
AT601	Workshop Practice	4	4	20	80	100
AT602	Mechatronics	4	4	20	80	100
AT603	Lab-Workshop Practice	2	4	25	25	50
AT604	Lab-Mechatronics	2	4	25	25	50
AT605	Project	6	12	20	80	100
General Education Components						
AT606	Entrepreneurship Development II	4	4	20	80	100
AT607	Industrial Engineering	4	4	20	80	100
AT608	Lab-Entrepreneurship Development II	2	4	25	25	50
AT609	Lab - Industrial Engineering	2	4	25	25	50
		30	44	200	500	700

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Course Structure of S.Y. Bachelor of Vocational (SEMESTER – III)

(Industrial Automation)

SEMESTER – III				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
IA301	Digital Electronics	3	3	15	60	75
IA302	Embedded System Concept	3	3	15	60	75
IA303	Fundamental of Microprocessor 8086	3	3	15	60	75
IA304	Lab- Digital Electronics	3	6	25	25	50
IA305	Lab- Embedded System Concept	3	6	25	25	50
IA306	Lab- Fundamental of Microprocessor 8086	3	6	25	25	50
General Education Components						
IA307	Industrial Ethics & Safety Management	4	4	20	80	100
IA308	Environment science	4	4	20	80	100
IA309	Lab - Industrial Ethics & Safety Management	2	4	25	25	50
IA310	Lab- Environment Science	2	4	25	25	50
		30	43	210	465	675

Course Structure of S.Y. Bachelor of Vocational (SEMESTER – IV)

(Industrial Automation)

SEMESTER – IV				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
IA401	Control System	3	3	15	60	75
IA402	Process Control	3	3	15	60	75
IA403	Fundamental of Hydraulic and Pneumatic System	3	3	15	60	75
IA404	Lab- Control System	3	6	25	25	50
IA405	Lab- Process Control	3	6	25	25	50
IA406	Lab- Fundamental of Hydraulic and Pneumatic System	3	6	25	25	50
General Education Components						
IA407	Business Communication	4	4	20	80	100
IA408	Personality Development	4	4	20	80	100
IA409	Lab-Business Communication	2	4	25	25	50
IA410	Lab-Personality Development	2	4	25	25	50
		30	43	210	465	675

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Course Structure of F.Y. Bachelor of Vocational (SEMESTER – V)

(Industrial Automation)

SEMESTER – V				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
IA501	PLC Based Automation & SCADA	3	3	15	60	75
IA502	Advance Embedded System	3	3	15	60	75
IA503	Industrial Robotics	3	3	15	60	75
IA504	Lab- PLC Based Automation & SCADA	3	6	25	25	50
IA505	Lab- Advance Embedded System	3	6	25	25	50
IA506	Lab-Industrial Robotics	3	6	25	25	50
General Education Components						
IA507	Entrepreneurship Development I	4	4	20	80	100
IA508	Quality Engineering & Industrial Management	4	4	20	80	100
IA509	Lab-Entrepreneurship Development I	2	4	25	25	50
IA510	Lab- Quality Engineering & Industrial Management	2	4	25	25	50
		30	43	210	465	675

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – VI)

(Industrial Automation)

SEMESTER – VI				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
IA601	Numerical Control	4	4	20	80	100
IA602	Mechatronics	4	4	20	80	100
IA603	Lab- Numerical Control	2	4	25	25	50
IA604	Lab-Mechatronics	2	4	25	25	50
IA605	Project	6	12	20	80	100
General Education Components						
IA606	Entrepreneurship Development II	4	4	20	80	100
IA607	Industrial Engineering	4	4	20	80	100
IA608	Lab-Entrepreneurship Development II	2	4	25	25	50
IA609	Lab - Industrial Engineering	2	4	25	25	50
		30	44	200	500	700

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Course Structure of S.Y. Bachelor of Vocational (SEMESTER – III)

(Farm Equipment & Machinery)

SEMESTER – III				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
FEM301	Auto Service Technician	3	3	15	60	75
FEM302	Auto Tools & Equipments	3	3	15	60	75
FEM303	Farm Engine Technology	3	3	15	60	75
FEM304	Lab-Auto Service Technician	3	6	25	25	50
FEM305	Lab-Auto Tools & Equipments	3	6	25	25	50
FEM306	Lab- Farm Engine Technology	3	6	25	25	50
General Education Components						
FEM307	Industrial Ethics & Safety Management	4	4	20	80	100
FEM308	Environment science	4	4	20	80	100
FEM309	Lab - Industrial Ethics & Safety Management	2	4	25	25	50
FEM310	Lab- Environment Science	2	4	25	25	50
		30	43	210	465	675

Course Structure of S.Y. Bachelor of Vocational (SEMESTER – IV)

(Farm Equipment & Machinery)

SEMESTER – IV				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
FEM401	Farm Equipment	3	3	15	60	75
FEM402	Farm Machinery	3	3	15	60	75
FEM403	Farm Transmission System	3	3	15	60	75
FEM404	Lab- Farm Equipment	3	6	25	25	50
FEM405	Lab- Farm Machinery	3	6	25	25	50
FEM406	Lab-Farm Transmission System	3	6	25	25	50
General Education Components						
FEM407	Business Communication	4	4	20	80	100
FEM408	Personality Development	4	4	20	80	100
FEM409	Lab-Business Communication	2	4	25	25	50
FEM410	Lab-Personality Development	2	4	25	25	50
		30	43	210	465	675

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Course Structure of F.Y. Bachelor of Vocational (SEMESTER – V)

(Farm Equipment & Machinery)

SEMESTER – V				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
FEM501	Electrical & Electronics System	3	3	15	60	75
FEM502	Hydraulics & Pneumatics	3	3	15	60	75
FEM503	Advance Farm Equipment	3	3	15	60	75
FEM504	Lab - Electrical & Electronics System	3	6	25	25	50
FEM505	Lab - Hydraulics & Pneumatics	3	6	25	25	50
FEM506	Lab- Advance Farm Equipment	3	6	25	25	50
General Education Components						
FEM507	Entrepreneurship Development I	4	4	20	80	100
FEM508	Quality Engineering & Industrial Management	4	4	20	80	100
FEM509	Lab-Entrepreneurship Development I	2	4	25	25	50
FEM510	Lab- Quality Engineering & Industrial Management	2	4	25	25	50
		30	43	210	465	675

Course Structure of F.Y. Bachelor of Vocational (SEMESTER – VI)

(Farm Equipment & Machinery)

SEMESTER – VI				Marks		
Paper Code	Title	No. of Credit	Hrs./ Week	Internal (CIA)	External (ESE)	Total
Skill Development Components						
FEM601	Workshop Practice	4	4	20	80	100
FEM602	Mechatronics	4	4	20	80	100
FEM603	Lab-Workshop Practice	2	4	25	25	50
FEM604	Lab-Mechatronics	2	4	25	25	50
FEM605	Project	6	12	20	80	100
General Education Components						
FEM606	Entrepreneurship Development II	4	4	20	80	100
FEM607	Industrial Engineering	4	4	20	80	100
FEM608	Lab-Entrepreneurship Development II	2	4	25	25	50
FEM609	Lab- Industrial Engineering	2	4	25	25	50
		30	44	200	500	700