DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

CIRCULAR NO. SU/Sci./B.Sc. Syllabi/6/2016

It is hereby inform to all concerned that, on the recommendations of the Committees/Ad-hoc Boards the Hon'ble Vice-Chancellor has accepted the following revised syllabi in his emergency powers under Section-14[7] of the Maharashtra Universities Act, 1994 on behalf of the Academic Council as mentioned against their names under the Faculty of Science :-

Sr. No.	B.Sc. III Year Revised Syllabi		Semester
[1]	B.Sc. Automobile Technology	[Degree Course],	V & VI
[2]	B.Sc. Workshop Technology	[Degree Course],	V & VI
[3]	B.Sc. Refrigeration & Air Conditioning	[Degree Course],	V & VI
[4]	B.Sc. Bioinformatics	[Degree Course].	V & VI
[5]	B.Sc. Biotechnology	[Optional],	V & VI
[6]	B.Sc. Horticulture	[Optional],	V & VI
[7]	B.Sc. Dry Land Agriculture	[Optional],	V & VI
[8]	B.Sc. Sericulture	[Optional],	V & VI

This is effective from the Academic Year 2016-2017 and onwards as appended herewith.

These **syllabi are also available on the University Website www.bamu.ac.in**

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

University Campus,
Aurangabad-431 004.
REF.NO.SU/B.Sc./2016/3849-68

Date:- 23-06-2016.

★ ★ ★ ★ ★ ★ ★
******

Director,
Board of College and
University Development.

Copy forwarded with compliments to :-

1] The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.

Copy to :-

1] The Controller of Examinations,
2] The Section Officer, [B.Sc. Unit],
3] The Section Officer, [B.C.S. Unit],
4] The Programmer [Computer Unit-1] Examinations,
5] The Programmer [Computer Unit-2] Examinations,
6] The In-Charge, E-Suvidha Kendra, [Professional Unit], Rajarshi Shahu Maharaj Pariksha Bhavan, Dr. Babasaheb Ambedkar Marathwada University,
7] The Record Keeper,
Dr. Babasaheb Ambedkar Marathwada University.

-=**=-

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD.

Revised Syllabus of

B.Sc. III Year

AUTOMOBILE TECHNOLOGY

Semester–V & VI

[Three Year Degree Course]

[Effective from 2016-17 & onwards]

A.T.

FIFTH SEMESTER

PAPER-XXIX
ENTREPRENEURSHIP DEVELOPMENT PROGRAMME-I

Teaching Scheme
Theory 3 hrs/week

Examination Scheme
Theory Exam50 Marks.

1 Introduction to Entrepreneurship, need, importance from national economy and global market.
2 Function of Entrepreneur- Contribution to economic growth, regional development, Employment generation, export promotion.
3 Different types of enterprises such as SSI, MSI, LSI, Pvt., Ltd., Public Ltd. etc.
4 Different types of ownership such as proprietorship, partnership, joint stock, cooperative society, etc.
5 Government policies to encourage business and study of various law of business such as excise duty, sales tax, income tax, custom duty, etc.

Term work

The term work shall consist of at least ten assignments based on the above syllabus.
The assessment of the term work will be based on the following criteria
1) The record of the assignment submitted.
2) The assessment of the term work to be conducted internally.
3) Viva vice

Books Recommended

1. Small business management – Iteeinlplf and burgess.
2. Marketing management - Philip Kotler.
3. Entrepreneurial Development (Himalaya Publishing)

PAPER-XXX.
AUTOMOBILE TROUBLES MAINTENANCE AND TESTING -I

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1) **Engine Troubles :** - Engine does not start, Engine start but stop immediately Engine looses power, low fuel economy, engine produces noise, engine does not stay on ideal speed, Engine misfire, cooling system trouble, Ignition system trouble, lubrication system trouble, charging system trouble, starting system trouble fuel supply system troubles for petrol & diesel engine.

2) **Servicing of Engine Systems:-** such as, fuel supply, Ignition, cooling, lubrication, clutch, gear box, Differential, suspension, Brake ,steering etc.

3) **Inspection Servicing & Repairs:** - various components of engine parts such as cylinder, piston, piston ring, connecting rods, crank shaft, valves, cam shaft, bearings etc. sealants & adhesives in servicing & maintenance duty.

4) **Engine Tune-up** Engine servicing minor repair like
Tappet setting, carburetor tune –up, timing setting, spark plug
Cleaning & testing, Fuel supply system, Lubrication system checkup.

5) **Engine Maintenance**: Introduction, types of maintenance
Preventive, breakdown, periodic maintenance -daily, weekly, monthly, scheduled. Maintaining interior cleaning, maintaining exterior cleaning, and maintenance schedules charts.

6) **Engine Testing:**
Introduction, Types of test, Engine tune-up tester, condensed test procedure, test report.

7) **Performance Characteristics of Engine**:
Terminology, Engine power, IHP, BHP, FHP, SAE power, Relation between torque & speed, Efficiency-mechanical, thermal, overall, volumetric, air standard, Relative Effect of compression ratio on efficiency, performance curves, Morse test, Heat balance sheet numerical.

Practical Based on above Chapter

PAPER-XXXI.
AUTOMOBILE ELECTRICAL & ELECTRONICS SYSTEM-I

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1) Battery Operations,
Types of batteries, Maintenance free batteries, Dry charged batteries, battery rating, battery charging.

2) Charging System :-
Introduction, Importance, system layout, Dynamo, construction, function operation, types, alternator constructions, operation, voltage regulator, electronics charging system

3) Automotive Lighting System;-
Electrical symbols, wiring system, wiring diagram of various types of head light, indicator light, size of wires, instrument panel, fuses, types of Switches.

Reference Books:-

1) Auto mechanics guide to Electronic Instrumentation by Lynn Mosher Publisher- Prentice Hall, New Jersy 1987
2) Automotive Electronics & compression controlled lighting system by Don Knowes, publisher- prentice Hall Inc New Jersy 1988
3) Advance electronics Diagnosis of Automobile by Don Knowles, publisher Prentice Hall Inc. New Jersey 1988
4) Auto mechanics understanding New Technology by Don Knowles, publisher prentice Hall Inc.New Jersy 1988
5) Santro and Accent Basic training Book by publisher –Hundai motors
6) Service manuals of all Euro II & Euro IV cors, publisher- Maruti udyog India Ltd.,
7) Automobile Electrical & Electrionic Equipment by youg & Griffiths Revised by G. E. fardin, publisher. The English language book society & Newness- Buffer worths London.
8) Automotive Electricals by Artur Jndge;
9) Automotive Electricals by Kohli.

Practical Based on above Chapter

PAPER –XXXII.
MECHATRONICS-I

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1) Number system and Boolean Algebra

1.1 Types of Number Systems.
1.2 Binary Codas.
1.3 Binary Arithmetic

2) Logic gates

2.1 Basic Logic Operation.
2.2 Logic gates
2.3 Boolean Algebra
2.4 Derived gates
2.5 Arithmetic Circuit

3) Sequential Logic Circuits

3.1 lip Flop
3.2 Registers
3.3 Counters

4) Operational Amplifiers (Op-Amps)

4.1 Introduction
4.2 Op-Amps Parameters
4.3 Linear Application of Op-Amps
4.4 Non- Linear Application of Op-Amps

5) Combinational Logic Circuits

5.1 D/A Converter
5.2 A/D Converter

6) Electronic Timers

6.1 Timer Fundamentals
6.2 Timer Circuits
6.3 Schmitt Trigger
6.4 555 Timer

References:-

01] Modern Digital Electronics	by	R.P. Jain
02] Introduction to Mechatronics and Measurement Systems	by	David G Alciator. Michael B Histand
03] Mechatronics..	by	W.Bolton
05] Mechatronics..	by	HMT Limited

Practical Based on above Chapter

PAPER –XXXIII.
BODY AND CHASSIS MAINTENANCE

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1 Frame –
Construction and types of frame and chassis for two & four wheeler, types of section , conventional integral, semi integral and frame less, structure, frame alignment

2 Body & Its Types
Introduction, types of bodies, parts of bodies aerodynamic consideration, body work, roof, doors, windows, wind shields, noise and vibrations, elements. Car interior decoration Integral, semi integral, rigid saloon open coach, double Decker, collapsible, energy absorbing bumpers. Interior trimming seats, rust prevention, specification, crash testing.

3 Safety Based Design –
Air bags, safety belts, safe drive, car accessories types of materials, composite and hybrid material.

4 Air Conditioning –
Introduction and necessity of AC, component used in AC such as compressor, condenser, evaporator, thermostat, Maintenance and testing, gas charging, refrigerant used.

5 Chassis lubrication–
Types of lubricants, like chassis grease, all purpose grease, grafied grease, gear oil, etc.

6 Body Repair & Painting
Denting, Body welding and patch work – Body Painting – Painting process, precautions in painting process, equipment used in painting shop.

7 Interior Decoration –
Internal cushioning, seat arrangement, glass windows, power windows, glass beading , center locking , wipers and wiper mechanism etc.

8 Vehicle Specifications
Ground clearance, wheel base, wheel track, turning radius, Height, Width,
Noise and vibration performance testing –

Practical Based on above Chapter

PAPER –XXXIV.
TRANSPORT MANAGEMENT

Teaching Scheme
Theory 3 hrs/week
Sessional: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1] Bus Transport Organization –

Classification road, water and air transport, their advantages and disadvantages. Passenger transport organization set up (MSRTC &Private Organization) urban and rural Transport. Theory of fares- flat fares and telescopic fares, scheduling of bus transport operation(M.S.R.T.C) and crewing. Co ordination between different department and maintenance department, calculation of cost of transport, various factors such as Geographical, social, Economical factor of bus transport operation . Layout of bus station, bus depot.

2] Goods Transport operation -

Basic Elements to transport- The way/ the vehicle, terminals infrastructural facilities. Various factors such as geographical, economical, social.

Goods transport organization – set up (for 1-vehicle,10-vehicle, 100-vehicle) fixation of cost of transport fixed cost and running cost. Various types of booking- to pay, paid billing. Factors to be consider for scheduling of goods transport, transport and storage of petroleum product.

3] Transport operation –

Various records, log book , trip operation sheet, truck history record, monthly operational performance statement, Goods consignment note, Daily fuel consumption, complaint book room map, use of computer in maintaining the various records.

Control of traffic, speed limit, various important fitness certificate kaizen operation and research.

References:-

1] Automobile Engg by K.M. Gupta vol II

2] Motor vehicle act 1988

3] Elements of Transport by R. J. Eatan

4] Motor Transportation by Hudson & constantin

5] fundamental principles of road passenger Transport operation by F. G.Fletcher

6] Economics of transport by H. R. Bonavia

7] Transport in modern India by K.P.Bhatnagar, Satish Bhatnagar, S.C.Gupta.

SIXTH SEMESTER

PAPER-XXXVI.
ENTREPRENEURSHIP DEVELOPMENT PROGRAMME-II

Teaching Scheme
Theory 3 hrs/week

Examination Scheme
Theory Exam50 Marks.

1 Concept & Philosophy of Entrepreneurship Evolution and development
2 Important qualities for an entrepreneur such as leadership, communication skill, deal making, frustration tolerance, hard work, persuasion etc.
3 Setting up new venture, search for new ideas, project identification, project report and business planning.

4 Study of various causes of failure of business and precaution to be taken to avoid failures.

5 Introduction to marketing concept, Definition, scope, objectives, marketing techniques.

Term work

The term work shall consist of at least ten assignments based on the above syllabus.
The assessment of the term work will be based on the following criteria
1) The record of the assignment submitted.
2) The assessment of the term work to be conducted internally.
3) Viva vice

Books Recommended

1) Small business management – Iteeinlplf and burgess.
2) Marketing management - Philip Kotler.
3) Entrepreneurial Development (Himalaya Publishing)

PAPER-XXXVII.
AUTOMOBILE TROUBLES MAINTENANCE AND TESTING -*II*

Teaching Scheme
Theory 3 hrs/week

Examination Scheme
Theory Exam50 Marks

01) Clutch: -

Clutch slips clutch drag clutch judder clutch rattle clutch petrol pulsating, clutch Noise.

02) Transmission: -

Gear Slips, Gear shifting hard, Gear loose produces noise, Sticks in gear, no power transmission, oil leaks.

03) Drive line:-

Vibration during running of vehicle, Noise in drive line, noise in differential.

04) Steering System:-

Excessive play in steering wheel hard steering car wander, car pulls is one side during normal driving, car pulls to one side during braking, front wheel shimmy. Improper tyre wears.

05) Suspension System:-

Hard or rough vide way on turns sagging spring, noise in suspension.

06) Brake System:-

Brake pedal goes to floor board, one brake drags, soft or spongy brake, poor brake efficiency, Noisy brake loss of brake fluid power brake troubles.

07) Servicing, Overhauling: -

Introduction, general awareness before servicing a vehicle, tightening torque Limits of wears & damages requiring repairs. General repair instruction.

08) Heater & Air Conditioning:-

Little or no heat, blower motor inoperative, too much heat, insufficient Defrosting, Insufficient cooling.

09) Performance characteristics of vehicle:
Grade ability of vehicles, Drawbar horse power, automotive resistances, rolling frictional, gradient, air, acceleration, tractive resistance & propelling power, power/weight ratio of vehicle, numerical.

Practical Based on above Chapter

PAPER-XXXVIII.

AUTOMOBILE ELECTRICAL & ELECTRONICS SYSTEM-II

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1) Electrical Accessories;-
Windshield wiper & motor, horn, heater, power window, speedometer, Odometer, temperature gauges, oil pressure gauge, fuel level gauge Head lamps, key less entry.

2) Electronic ignition system
Introduction (CDI), components, operation, sparks advance mechanism

3) Starting System;-
Function, importance, layout, various component of system, starting motor Construction, working, solenoid and relays, starter drives, starting system in two Wheeler.

Reference Books:-

1) Auto mechanics guide to Electronic Instrumentation by Lynn Mosher Publisher- Prentice Hall, New Jersey 1987

2) Automotive Electronics & compression controlled lighting system by Don Knowes, publisher- prentice Hall inc New Jersy 1988

3) Advance electronics Diagnosis of Automobile by Don Knowles, publisher Prentice Hall Inc. New Jersey 1988

4) Auto mechanics understanding New Technology by Don Knowles, publisher Prentice Hall Inc. New Jersey 1988

5) Santro and Accent Basic training Book by publisher –Hyundai motors

6) Service manuals of all Euro II & Euro IV publisher- Maruti udyog India Ltd

7) Automobile Electrical & Electronic Equipment by young & Griffiths Revised by G. E. fardin, publisher

The English language book society & Newness- Buffer worths London .

8) Automotive Electrical by Artur Jndge;

9) Automotive Electrical by Kohli.

Practical Based on above Chapter

PAPER-XXXIX.
MECHATRONICS-II

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

1) Mechatronics	1.1	What is Mechatronics?
	1.2	Systems
	1.3	Measurement systems
	1.4	Control systems
	1.5	Microprocessor-based controllers
	1.6	Response of systems
	1.7	The Mechatronics approach Problems
2) Sensors and transducers	2.1	Sensors and transducers
	2.2	Performance terminology
	2.3	Displacement, position and proximity
	2.4	Velocity and motion
	2.5	Force
	2.6	Fluid Pressure
	2.7	Liquid Flow
	2.8	Liquid Level
	2.9	Temperature
	2.10	Light Sensor
	2.11	Selection of sensors
	2.12	Inputting data by switches Problems
3) Electrical actuation systems	3.1	Electrical systems
	3.2	Mechanical switches
	3.3	Solid- state switches
	3.4	Solenoids
	3.5	D.C. motors
	3.6	Stepper motors problems
4) Introduction to Microprocessor	4.1	Introduction
	4.2	Features of 8085
	4.3	Architecture of 8085
		a) Registers

b) ALU
c) Address Buffer
d) Address / Data Buffer
e) Interrupt control
f) Timing & control circuitry

4.4 Pin connection of 8085

5) The 8051 microcontroller

5.1 Block Diagram
5.2 Over View of 8051 microcontroller family
5.3 Connection of 8051 & 89C51 Microcontroller
5.4 Input output port

6) Motor control Relay

6.1 DC & Steeper motor
6.2 LCD Display
6.3 LED
6.4 Seven segment display
6.5 Interfacing of Sensors
6.6 Controller and display device

Reference Books

1) Microprocessor Technique - By Atul P. Godse & Deepali A Godse
2) Mechatronics - By W.Bolten
3) The 8051 Micro controller Embedded System - By M.A. Mazidi

Practical Based on above Chapter

PAPER-XL

AUTO CAD (COMPUTER AIDED DESIGN)

Teaching Scheme
Theory 3 hrs/week
Practical: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

01) AN INTRODUCTION TO AUTO CAD

*The X,Y co-ordinate system*Angular Measurement*Entering Points In AutoCAD*Various Types Co-ordinates*The Status Bar*Basic AutoCAD Terminology.

02) DRAWING OBJECTS

*Introduction*Types of Command*Direct Distance Entry*Various Tracking Such as Polar, Object Snap.

03) DRAWING AIDS & MODIFYING OBJECTS

*Introduction*Types of Command such as ORTHO, GRID, DRAWING LIMITS, SNAP, DRAWING AIDS.*The Function Keys. *Introduction*Types of Command ERASE, COPY, MIRROR, OFFSET, ARRAY, MOVE, ROTATE, SCALE, STRETCH, LENGTH, TRIM, EXTEND, BREAK, CHAMFER, FILLET, EXPLODE.

04) OBJECT SNAP & ADVANCED FEATURES

*Introduction*Object Snap*Object Snap Cycling. *Zooming & Panning*Blocks*Attributes*Hatching*Using X-REFS.

05) OBJECT PROPERTIES, UNITS & SCALES

*Introduction*Types of LAYERE & Command. Colors'.*Line types* The Match Properties Command.*Introduction*Units Control*Linear Units*Angular Units*Unit Precision*ISO Paper Sizes*Common Plot.

06) USER CO-ORDINATE SYSTEMS & DIMENSIONING

*Introduction*The UCS Command*The 3 Point Option* The UCSICON Command* UCS Command Options* The UCS Control Dialogue Box* The UCS Follow system variable* Other UCS Icons* *Introduction*Types Of Dimension Commands LINEAR, CONTINUE, BASELINE, ALIGNED, RADIAL, DIAMETER, RADIUS, CENTER MARK,EDIT, STYLE, * Angular Dimensions* Ordinate Dimensions *Dimension Scale.

07) 3D CAD

*Introduction*C-D CAD Terminology*Isometric Drawing*The 3 D Co-ordinate System*Viewing 3-D Objects*Perspective Views*The Properties command*Basic wire-Frame Models*The 3D Face Command*Region & 3-D Surfaces*Revolved Objects*Drawing The Table*Adding Materials*3D Objects,

08) PAPER SPACE AND LAYOUT

*Introduction*Overview of Paper Space*Creating a Drawing Sheet Space*Creating the View ports*Other Paper Space Considerations.

Reference Books:-

01] CAD All India Council For Professional Training & Research Pvt.Ltd.
02] CAD/ CAM-by Zimmer & Groover, PHI Publications,
03] CAD/ CAM/CIM-by Radha Krishnan,
04] CAD/ CAM –by P.N.Rao

Practical Based on above Chapter

PAPER-XLI

VEHICLE RULES

Teaching Scheme
Theory 3 hrs/week
Sessional: 3hrs/week

Examination Scheme
Theory Exam50 Marks.

01] Motor Vehicle Act –

Overview of motor vehicle act 1939, motor vehicle act 1988, Terms defined in motor vehicle act, Driving license, Registration of vehicle, transfer of ownership, sales of new vehicle, Hire purchase, cancellation of hire purchase, permits, fitness, taxation, state transfer of vehicle , Registration mark.

02] Traffic Signs & Rules:-

Organization & Duties of traffic control department, road safety, Traffic signs. Transport authority & their responsibility. Traffic offence & punishment safe driving skill, highway codes.

03] Insurance –

Difference between Assurance & Insurance, different types of insurance- life, fire, motor vehicle comprehensive, third party. Procedure of accident claim & settlement, furnishing of particular vehicle involved in accident, duty of driver in case of accident. Surveyor and loss assessor- role function of surveyor, loss assessment of accident vehicle , How to claim & where.

References:-

1] Automobile Engg -by K.M. Gupta vol II 2] Motor vehicle act 1988
3] Fundamental principles of road passenger Transport operation by F. G.Fletcher
4] Elements of Transport by R. J. Eatan
5] Motor Transportation by Hudson & constantin
6] Economics of transport by H. R. Bonavia
7] Transport in modern India by K.P.Bhatnagar, Satish Bhatnagar, S.C.Gupta.

-=**=-