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Shri AcharyaratnaDeshbhooshanShikshanPrasarak Mandal, Kolhapur

Mahavir Mahavidyalaya, Kolhapur (Autonomous)

Affiliated to Shivaji University, Kolhapur

Syllabus for Choice Based Credit System (CBCS) Bachelor of Vocation (B. Voc.) Programme

Programme	**Bachelor of Vocation in AUTOMOBILE**
Part	**III**
Semester	**VI**
Course Code	
Course Name	**AUTOMOBILE**
Course Title	**--**
Paper No.	**--**

Under the Faculty of Interdisciplinary Studies

(To be introduced from Academic Year 2023 – 2024 onwards) Subject tothe revisions& modifications made from time to time)

Mahavir Mahavidyalaya, Kolhapur (Autonomous)

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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE**		
Part	**III**	Semester	**VI**
Course	Transport Management &Motor Vehicle	Course Code	**BV C61**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**03**	Contact Hours	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To acquire basic knowledge of motor vehicle acts.
ii)	To get broad knowledge about insurance and taxation.
iii)	To get interests in motor industry advance technique.
iv)	To study details about management.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	**CR**	**IH**
Unit I : Motor Vehicle Act	0.75	12
1.1 Laws governing to use of motor vehicle and vehicle transport, licensing of drivers and conductors, traffic rules, signals and controls		
1.2 Accidents, causes and analysis, liabilities and preventive measures.		
1.3 Government administration structure, authorities and duties, rules regarding construction of motor vehicles		
1.4 New motor vehicle act		
Unit II : Taxation & Insurance	0.75	12
2.1 Objectives of taxation, structure and methods of laving taxation		
2.2 Insurance types (comprehensive, third party, zero depth insurance), Hit and run case, duty of driver in case of accident.		
2.3 Surveyor's report estimation and valuation of vehicle.		
2.4. Importance of warranty system and protection of law: deal with defects, benefits of warranty system.		
Unit III : Goods & Passenger Transport Operations	0.75	12
3.1 Structure of passenger transport & good transport organization, Scheduling.		
3.2 Goods transport operation, storage and transportation of petroleum products.		
3.3 Management Information System (MIS) in passenger /goods transport		

operation.		
3.4 Operation cost and revenues, economics and records working of various state transport organizations. (MSRTC, BEST)		

Unit IV : Traffic Management & Motor Industry.	0.75	12
4.1 Introduction to Traffic navigation system.		
4.2 Global positioning system functions and role of automobile industry.		
4.3 Automobile industry & various research organizations in India (central institute of road transport, automotive research, vehicle research, central road research institute and petroleum conservation and research association)		

D) Reference Materials	
D1) Text Books for Reading	
1.	P. Sudarsanam Passenger Amenities in STU CIRT, Pune.
2.	P. Sudarsanam. Bus station Management CIRT, Pune.
3.	P.G. Patankar Director Compedium of Transport Terms, CIRT, Pune.
D2) Books for Reference	
1.	Motor Vehicle Act, 1988 Home Department (M.S.)
2.	Central M. V. Rules 1989 Home Department (M.S)

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		**Blooms Taxonomy**
CO1	Demonstrate transport management systems	
CO2	Interpret about vehicle insurance and taxation.	
CO3	Demonstrate understanding of motor vehicle act.	
CO4	Implement advance techniques in traffic management.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	**Total Marks**	**50**

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	
2.		
3.		
4.		
5.	**Total Marks**	**10**

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	**Total Marks**	**40**

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A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE**		
Part	**III**	Semester	**VI**
Course	Industrial organization & Management	Course Code	**BV C62**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**03**	Contact Hours	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To get advance knowledge about industrial organization and management.
ii)	Understand the functions of management such as planning, organizing and decision making.
iii)	Discuss the relevance of management disciplines as a means of improving productive performance.
iv)	To understand production and quality management

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units	**CR**	**IH**
Unit I : Organization & Organization Structure	0.75	12
1.1 Necessity of Organization, Principle of organization, Functions of Management.		
1.2 Importance of Management, Modern Management Theories. Advantages and limitations of ownership.		
1.3 Public Corporations, Advantages and limitations of public corporation, Joint Stock Company, Advantages and limitations of Joint Stock Company.		
1.4 Line and Staff Organization, Advantages and dis– advantages.		
Unit II : Purchasing ,Marketing & Personal Management	0.75	12
2.1 Introduction to purchasing and Marketing. Functions of Purchasing & Marketing		
2.2 Methods of purchasing & Marketing, Advertising.		
2.3 Introduction to personal management. Functions Of personal management.		
2.4. Development of personal policies, Manpower planning recruitment & selection of manpower, Training and Development.		

Unit III : Motivation, Leadership & Entrepreneurship	0.75	12
3.1 Human needs, Maslow's Hierarchy of needs. Types of motivation, techniques of motivation.		
3.2 Qualities of a good Leader. Skills of Leadership.		
3.3 Introduction to Entrepreneurship Development, Entrepreneurial Characteristics.		
3.4 Steps for establishing small scale unit.		
Unit IV : Management Information System	0.75	12
4.1 Need, function and Importance of MIS.		
4.2 Organizational Structure and MIS.		
4.3 Classification of Information Systems.		

D) Reference Materials	
D1) Text Books for Reading	
1.	"Industrial Engineering Handbook", Editor – in – Chief, 4th Edition, McGraw Hill, 19xx E. S. Buffa and R. K. Sarin
2.	"Organizational Management", Author- Saint Martin's University.
3.	"Information Systems in Management " , 4th Edition, Wadsworth Inc., 1990 P. Hershey and K. H. Blanchard,
D2) Books for Reference	
1.	"Management of Organizational Behavior – Utilizing Human Resources ", 4th Edition, Prentice – Hall Inc., 1982 M. Mahajan.
2.	"Personnel Management", Himalaya Publishing House – 1989
3.	Management Information System", Prentice Hall of India Pvt Ltd, 1997 C. B. Mamoria.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		**Blooms Taxonomy**
CO1	Students should be able to use concepts of production and quality management to improve productivity and quality in manufacturing plants.	
CO2	To gain acknowledge about leadership techniques.	
CO3	To get detail knowledge about purchasing & marketing management.	
CO4	To get knowledge about marketing and sales to improve profitability of business.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	**Total Marks**	**50**

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	
2.		
3.		
4.		
5.	**Total Marks**	**10**

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	**Total Marks**	**40**

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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc) AUTOMOBILE**		
Part	**III**	Semester	**VI**
Course	Electric and Hybrid Vehicles	Course Code	**BV C63**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**03**	Contact Hours	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To study about the evolution of the Electric and Hybrid Electric Vehicles, Classification and terminologies related to it.
ii)	Explain the basics of electric and hybrid electric vehicles, architecture and its fundamentals.
iii)	Discuss different energy storage technologies used for hybrid electric vehicles and their control.
iv)	Know about the Electric & Hybrid Electric Vehicle challenges and opportunities.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units		**CR**	**IH**
Unit I: Introduce to Electric vehicle & Hybrid vehicle		0.75	12
1.1	Introduction, Components of electric & hybrid vehicle		
1.2	Advantages, Disadvantages & application of electric & hybrid vehicle. Performance characteristics of electric & hybrid vehicle.		
1.3	Introduction to DC shunt series, compound wounds & induction motors. Calculation of road load, predicting fuel economic greed connected hybrid.		
Unit II: Specifications of Hybrid Architectures & Power Plants.		0.75	12
2.1	Introduction to configuration of locomotive drives, series parallel switching load tracking architecture.		
2.2	State power assist, dual mode, power split. power split with shift continuously variable transmission (CVT).		
2.3	Braking and energy recuperation, drive cycle implications.		

Unit III: Fuel Cells & Energy Storage Technology	0.75	12
3.1 characteristics of fuel cell, types of fuel cell. Direct methanol fuel cell solid oxide fuel cell. Hydrogen storage systems. Fuel cell EV.		
3.2 Matching electric drive and ICE. Sizing the propulsion motor; sizing power electronics.		
3.3 Advance batteries of electric and hybrid motors. Specification of advance batteries & motors.		
Unit IV : Nonelectric Hybrid Systems	0.75	12
4.1 Short term storage systems flywheel accumulators		
4.2 Continuously variable transmissions hydraulic accumulator's hydraulic pumps/motors pneumatic hybrid engine systems operation mode.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Electric and Hybrid Vehicles, Robin Hardy- Iqbal Husain- CRC Press
D2) Books for Reference	
1.	Handbook of Electric Motors- Hamid A Toliyat - Gerald B Kliman - Marcel Decker Inc
2.	Energy Technology Analysis Prospects for Hydrogen and Fuel Cells- International Energy Agency France.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		**Blooms Taxonomy**
CO1	Explain the basics of electric and hybrid electric vehicles, their architecture, technologies and fundamentals.	
CO2	Interpret working of different configurations of electric vehicles and its components, hybrid vehicle configuration, performance analysis and Energy Management strategies in HEVs.	
CO3	Apply concepts in practical.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	**Total Marks**	**50**

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	
2.		
3.		
4.		
5.	**Total Marks**	**10**

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	**Total Marks**	**40**

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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Programme	**Bachelor of Vocation (B.Voc) AUTOMOBILE**		
Part	**III**	Semester	**VI**
Course	Tractors, Farm equipment and Special Purpose equipment	Course Code	**BV C64**
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**03**	Contact Hours	**04 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To demonstrate knowledge of Tractors, Farm equipment and Special Purpose Equipments.
ii)	Make choices to carry out marking of the components for Transmission, Drives in the workshop following safety precautions.
iii)	Interpret various Steering, Breaking & Suspension Systems in Tractors
iv)	To study details in tractors equipment transmission system.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Units		**CR**	**IH**
Unit I: Introduction to Equipment		0.75	12
1.1	Introduction**,** Different types of earth moving equipment's and their applications. Dozers, Loaders, Shovels, Excavators, Scrapers.		
1.2	Functions of Motor graders, Rollers, Compactors, Tractors and Attachments.		
1.3.	Function of Dozers, Loaders, Shovels, Excavators, Scrapers		
Unit II: Engine Transmission & Final Drives		0.75	12
2.1	All systems of engine and special features like Automatic injection timer, turbochargers, after coolers etc.		
2.2	Basic types of transmissions, auxiliary transmission, constructional and working principles, hydro shift automatic Transmission and retarders		
2.3	FINAL DRIVES: Types of reductions like, single reduction, double reduction of final drives		

Unit III : Steering Breaking & Suspension System		0.75	12
3.1	Types of power steering, construction & working of semi-integral & integral power steering.		
3.2	Types of brakes, construction & working disc brake, drum brake.		
3.3	Introduction to tyre and tracked vehicles. advantages and disadvantages,		
3.4	Functions of under carriage components like tracks, roller frames, drives sprockets, track rollers. Construction & working of rubber spring suspension and air spring suspension.		
Unit IV: Selection of Equipment, Maintenance & safety		0.75	12
4.1	Types of maintenance schedule purpose and advantages. Safety methods for earth moving equipment's		
4.2	Selection of machines, Basic rules of equipment's including the nature of operation.		
4.3.	Selection of equipment's type of soil, haul distance, weather condition.		

D) Reference Materials	
D1) Text Books for Reading	
1.	Diesel equipment- volume I and II by Erich J.schulz
2.	Construction equipment and its management By S.C. Sharma.
D2) Books for Reference	
1.	Farm machinery and mechanism by Donald R. hunt and L. W.garner
2.	Theory of ground vehicles by J.Y.Wong john wiley and sons
3.	On and with the earth by Jagman Singh, W.Newman and Co. culkatta.

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		Blooms Taxonomy
CO1	Students will be able to identify different systems of tractor and know about their functioning.	
CO2	To get awareness & importance abouts tractor farm equipment.	
CO3	To skill the student about how to attach implements with the tractor and how to operate them.	
CO4	Apply concepts in practical.	

G) Scheme of Course Evaluation		
1.	End Semester Examination (ESE)	40
2.	Continuous Internal Evaluation (CIE)	10
3.	**Total Marks**	**50**

H) Suggested techniques for Continuous Internal Evaluation (10 Marks)		
1.	Home assignments	
2.		
3.		
4.		
5.	**Total Marks**	**10**

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	MCQ	10
2.	Short Answer	10
3.	Short Note	10
4.	Long Answer	10
5.	**Total Marks**	**40**

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A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE.**		
Part	**III**	Semester	**VI**
Course	Transport Management Lab	Course Code	
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**04**	Contact Hours	**06 / Week**
Course Title	--		

B) Course Objectives:	
i)	Analysis of future condition of transportation.
ii)	Understand the urban and regional transportation systems.
iii)	Understand analysis of traffic for future condition
iv)	Understand traffic survey

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Practical:		**CR**	**IH**
1.	Collecting the various Forms used in Motor Insurance Business & study it.	04	75
2.	Prepare various types of the Accident Survey Report.		
3.	Collecting information on latest developments in Motor Insurance Sector through various sources like Journals, Newspapers, Company Websites etc. and prepare its report		
4.	Prepare the Claim Settlement documents for typical Accident		
5.	Conduct the interview of the Surveyor and Loss Assessor and ascertain his role in Insurance Business		
6.	Prepare a report on Amendment of the Motor Vehicle Act		

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		Blooms Taxonomy
CO1	Understand Motor Insurance Business	
CO2	After Motor Vehicle Accident Proceedings	
CO3	Accidental Settlements	

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical (Lab-work)	25
2.	Submission practical record book & project report	15
3.	Viva-voce	10
4.	**Total**	**50**

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A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE.**		
Part	**III**	Semester	**VI**
Course	Internship	Course Code	
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**04**	Contact Hours	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To observe actual practical knowledge in Industries
ii)	To understand organizational systems
iii)	To understand the organizational hierarchy
iv)	Analyze & Interpret Research specific goals in the Industry

C) Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Practical:		**CR**	**IH**
1.	Any organizational 3 month internship / research topic with daily attendance report and with GPS daily photo & report writing.	04	75

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		Blooms Taxonomy
CO1	Hands-On experience in the industry	
CO2	Become aware about Market trends & know-hows	
CO3	Brain Storming of Industrial shortcomings	

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical (Lab-work)	25
2.	Submission practical record book & project report	15
3.	Viva-voce	10
4.	**Total**	**50**

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(New syllabus under Autonomy to be introduced from June, 2023 onwards)

A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE.**		
Part	**III**	Semester	**VI**
Course	Electrical & hybrid Vehicle	Course Code	
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**04**	Contact Hours	**06 / Week**
Course Title	**--**		

B) Course Objectives:	
i)	To get details study about electrical & hybrid components
ii)	To get broad knowledge about electrical motors.
iii)	To get innovative knowledge about electrical & hybrid vehicle
iv)	To get advance knowledge about hybrid vehicle

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Practical:		**CR**	**IH**
1.	Demonstration of body structure of electrical vehicle.	04	75
2.	Demonstration of body structure of hybrid vehicle.		
3.	Study of Battery Management System in electrical vehicle.		
4.	Study of motors in electrical & hybrid vehicle		
5.	Study of charging system in electrical vehicle		
6.	Study of wiring harness in electrical & hybrid vehicle		

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		Blooms Taxonomy
CO1	Able to understand the electrical hybrid vehicles	
CO2	Able to detail knowledge about battery, motors, electrical harness	
CO3	Able to innovative knowledge about the electrical &hybrid vehicles	

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical (Lab-work)	25
2.	Submission practical record book & project report	15
3.	Viva-voce	10
4.	**Total**	**50**

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A) Primary Information:			
Program	**Bachelor of Vocation (B. Voc.) AUTOMOBILE.**		
Part	**III**	Semester	**VI**
Course	Tractor and Farm Equipment Lab	Course Code	
Paper No.	**--**	Course Type	**Semester**
Total Marks	**50 Marks**	Implementation	**2023 – 2024**
Total Credits	**04**	Contact Hours	**06 / Week**
Course Title	--		

B) Course Objectives:	
i)	To get details study about tractor & farm equipment.
ii)	To get details in transmission drives.
iii)	To develop awareness about maintenance & safety.
iv)	To get knowledge about selection methods of equipment.

C) Course Syllabi:
(CR = Credits / IH: Instructional Hours)

Practical:		**CR**	**IH**
1.	Introduction to transmission systems and components.	04	75
2.	Study of brake system of a tractor.		
3.	Study on differential and final drive of a tractor.		
4.	Introduction to various farm machines and visit to implement's shed.		
5.	Study of different types of gear box.		
6.	Construction & working of rotavator.		

E) Suggested methods of Teaching:	
i)	Online teaching/ Offline / Internship
ii)	Power point presentation/ Seminars
iii)	Group discussion/ Hands on training
iv)	Demonstration/ Industrial training

F) Course Outcomes:		Blooms Taxonomy
CO1	Able to understand types of gearbox & speed ratios.	
CO2	Awareness in importance brake system.	
CO3	Apply concepts in practical.	

I) Question Paper Pattern (40 Marks)		
Q. No.	**Nature / Type of Question**	**Marks**
1.	Practical (Lab-work)	25
2.	Submission practical record book & project report	15
3.	Viva-voce	10
4.	**Total**	**50**

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