

|| शीलं परं भूषणम् ||

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         | I                                  |
| Semester     | I                                  |
| Course Code  | BVC11                              |
| Course Name  | AUTOMOBILE                         |
| Course Title | --                                 |
| Paper No.    | --                                 |

**Under the Faculty of Interdisciplinary Studies**  
(To be introduced from Academic Year 2021 – 22 onwards)  
Subject to the revisions& modifications made from time to time

**Mahavir Mahavidyalaya, Kolhapur(Autonomous)**  
**Affiliated to Shivaji University, Kolhapur**  
 (New syllabus under Autonomy to be introduced from June, 2021 onwards)

| <b>A) Primary Information:</b> |                                                 |                |                  |
|--------------------------------|-------------------------------------------------|----------------|------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc.) AUTOMOBILE</b> |                |                  |
| Part                           | <b>I</b>                                        | Semester       | <b>I</b>         |
| Course                         | Automobile Transmission Systems.                | Course Code    | <b>BVC11</b>     |
| Paper No.                      | --                                              | Course Type    | <b>Semester</b>  |
| Total Marks                    | <b>50 Marks</b>                                 | Implementation | <b>2021 - 22</b> |
| Total Credits                  | <b>03</b>                                       | Contact Hours  | <b>04 / Week</b> |
| Course Title                   | --                                              |                |                  |

| <b>B) Course Objectives:</b> |                                                                         |
|------------------------------|-------------------------------------------------------------------------|
| i)                           | To acquire basic knowledge of automobile                                |
| ii)                          | To get broad knowledge in automobile transmission systems.              |
| iii)                         | To get interests in construction working of transmission systems parts. |
| iv)                          | To study details of transmission systems.                               |

| <b>C) Course Syllabi:</b><br>(CR = Credits / IH: Instructional Hours) |           |           |
|-----------------------------------------------------------------------|-----------|-----------|
| <b>Units</b>                                                          | <b>CR</b> | <b>IH</b> |
| <b>Unit I : Vehicles &amp; Vehicles layouts</b>                       | 0.75      | 12        |
| 1.1 Introduction, Classification of automobile.                       |           |           |
| 1.2 Vehicle types.                                                    |           |           |
| 1.3 Types of chassis layout as per drives.                            |           |           |
| 1.4 Typesy of chassis layout- fully forward, Semi forward.            |           |           |
| <b>Unit II : Clutches</b>                                             | 0.75      | 12        |
| 2.1 Introduction, Principle, functions & general requirements.        |           |           |
| 2.2 Types of clutches.                                                |           |           |
| 2.3 Lining materials                                                  |           |           |
| 2.4. Clutch linkages                                                  |           |           |
| <b>Unit III : Gear Box</b>                                            | 0.75      | 12        |
| 3.1 Necessity,Requirements &Functions of gear box                     |           |           |
| 3.2 Types of gear box                                                 |           |           |
| 3.3 Principle, construction and working,Lubrication of gear box       |           |           |
| 3.4 Gear shifting mechanism.                                          |           |           |

|                                                                                                                    |      |    |
|--------------------------------------------------------------------------------------------------------------------|------|----|
| <b>Unit IV : Drive Lines&amp; Final Drive</b>                                                                      |      |    |
| 4.1 Propeller shaft, universal joints, hooks and constant velocity joints.                                         | 0.75 | 12 |
| 4.2 Drive line arrangements - Hotchkiss drive & torque tube drive.                                                 |      |    |
| 4.3 Live and dead axles, Axle shafts.                                                                              |      |    |
| 4.4 Purpose of final drive & drive ratio, Different types of final drives, Need of differential, Differential unit |      |    |

#### **D) Reference Materials**

##### **D1) Text Books for Reading**

|    |                                                                 |
|----|-----------------------------------------------------------------|
| 1. | Automobile Dr. Kirpal Singh                                     |
| 2. | The Motor vehicle Newton, Steeds, Garrett, Butterworth Heinmann |
| 3. | Automobile Vol.-2 Anil Chikara, Standard Publishers             |

##### **D2) Books for Reference**

|    |                                                         |
|----|---------------------------------------------------------|
| 1. | Automobile Mechanics Crouse / Anglin. Tata McGraw Hill. |
| 2. | Automobile R.B. Gupta, Satya Prakashan                  |
| 3. | Automotive Technology H. M. Sethi, Tata McGraw Hill     |

#### **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    |

| <b>F) Course Outcomes:</b> |                                                                   | <b>Blooms Taxonomy</b> |
|----------------------------|-------------------------------------------------------------------|------------------------|
| CO1                        | Comprehension of transmission systems.                            |                        |
| CO2                        | Analytical reasoning.                                             |                        |
| CO3                        | Understanding industrially importance of automobile transmissions |                        |
| CO4                        | Apply concepts of transmission systems.                           |                        |

#### **G) Scheme of Course Evaluation**

|    |                                      |           |
|----|--------------------------------------|-----------|
| 1. | End Semester Examination (ESE)       | 40        |
| 2. | Continuous Internal Evaluation (CIE) | 10        |
| 3. | <b>Total Marks</b>                   | <b>50</b> |

| <b>H) Suggested techniques for Continuous Internal Evaluation ( 10 Marks)</b> |                    |           |
|-------------------------------------------------------------------------------|--------------------|-----------|
| <b>1.</b>                                                                     | Home assignments   |           |
| <b>2.</b>                                                                     |                    |           |
| <b>3.</b>                                                                     |                    |           |
| <b>4.</b>                                                                     |                    |           |
| <b>5.</b>                                                                     | <b>Total Marks</b> | <b>10</b> |

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

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**Mahavir Mahavidyalaya, Kolhapur(Autonomous)**  
**Affiliated to Shivaji University, Kolhapur**  
**(New syllabus under Autonomy to be introduced from June, 2021 onwards)**

| <b>A) Primary Information:</b> |                                                 |                |                  |
|--------------------------------|-------------------------------------------------|----------------|------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc.) AUTOMOBILE</b> |                |                  |
| Part                           | <b>I</b>                                        | Semester       | <b>I</b>         |
| Course                         | S.I. Engines.                                   | Course Code    | <b>BVC12</b>     |
| Paper No.                      | --                                              | Course Type    | <b>Semester</b>  |
| Total Marks                    | <b>50 Marks</b>                                 | Implementation | <b>2021 - 22</b> |
| Total Credits                  | <b>03</b>                                       | Contact Hours  | <b>04 / Week</b> |
| Course Title                   | <b>--</b>                                       |                |                  |

| <b>B) Course Objectives:</b> |                                                             |
|------------------------------|-------------------------------------------------------------|
| i)                           | To acquire basic knowledge of S.I. Engines.                 |
| ii)                          | To get broad knowledge in S.I. Engines.                     |
| iii)                         | To get interests in construction working S.I. Engine parts. |
| iv)                          | To study details of S.I. Engines.                           |

| <b>C) Course Syllabi:</b><br>(CR = Credits / IH: Instructional Hours)                                                                 |           |           |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>Units</b>                                                                                                                          | <b>CR</b> | <b>IH</b> |
| <b>Unit I : Introduction to S.I. Engines.</b>                                                                                         | 0.75      | 12        |
| 1.1 Introduction, Nomenclature, Classification of petrol engines, Merits and Demerits of petrol engines.                              |           |           |
| 1.2 Thermodynamic cycle of petrol engine, Four stroke petrol engine, Two stroke petrol engine – Construction, working,                |           |           |
| 1.3 Valve & port arrangements, scavenging systems,.                                                                                   |           |           |
| 1.4 comparison with 4 stroke engines, Advantages, Disadvantages of two and four stroke petrol engines                                 |           |           |
| <b>Unit II : Engine components.</b>                                                                                                   | 0.75      | 12        |
| 2.1 Cylinder block, cylinder liner, types of liner, cylinder head, gaskets, type of gaskets,                                          |           |           |
| 2.2 Piston, piston ring, pin, Crank shaft, camshaft, connecting rod.                                                                  |           |           |
| 2.3 Valve, valve mechanisms, valve timing, port-timing diagram, manifolds, flywheel.                                                  |           |           |
| 2.4. Principles of carburetion, Simple carburetor, Starting, Idling & slow running, acceleration, Main metering system, choke system. |           |           |
| 2.5. S.U. Carburetor, Solex carburetor, Modern Carburetors, Carburetors used in two wheelers and four wheelers.                       |           |           |
| 2.6. Electronic fuel injection system, Multi point fuel injection                                                                     |           |           |

|                                                                                    |      |    |
|------------------------------------------------------------------------------------|------|----|
| system.                                                                            |      |    |
| <b>Unit III : Engine cooling &amp; Lubrication systems</b>                         |      |    |
| 3.1 Introduction – Purpose of cooling,                                             | 0.75 | 12 |
| 3.2 Systems- Air cooling system, water cooling systems. & Parts of cooling system. |      |    |
| 3.3 Introduction & Purpose of lubrication.                                         |      |    |
| 3.4 Functions and properties of engine lubricating oils, additives for Lubricants. |      |    |
| 3.5. Dry Sump lubrication system, wet sump lubrication system.                     |      |    |
| <b>Unit IV : Ignition System</b>                                                   |      |    |
| 4.1 Requirement of ignition system.                                                | 0.75 | 12 |
| 4.2 Types- Battery ignition and Magneto ignition.                                  |      |    |
| 4.3 Working of Battery, Ignition coil & Spark plug                                 |      |    |
| 4.4 Electronic engine control unit (ECU).                                          |      |    |

|                                   |                                                                    |
|-----------------------------------|--------------------------------------------------------------------|
| <b>D) Reference Materials</b>     |                                                                    |
| <b>D1) Text Books for Reading</b> |                                                                    |
| 1.                                | Internal combustion engine M.L Mathur R.P.Sharma, Dhanpat Rai Pub. |
| 2.                                | Automobile Dr. Kirpal Singh                                        |
| 3.                                | The Motor vehicle Newton, Steeds, Garrett, Butterworth.            |
| 4.                                | Automobile Vol.-2 Anil Chikara, Standard Publishers.               |
| <b>D2) Books for Reference</b>    |                                                                    |
| 1.                                | I C Engine V. Ganeshan, Tata McGraw Hill.                          |
| 2.                                | Automobile R.B. Gupta, Satya Prakashan                             |
| 3.                                | Automotive Technology H. M. Sethi, Tata McGraw Hill.               |

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

|                            |                                                  |                        |
|----------------------------|--------------------------------------------------|------------------------|
| <b>F) Course Outcomes:</b> |                                                  | <b>Blooms Taxonomy</b> |
| CO1                        | Apply the knowledge of S.I. Engines.             |                        |
| CO2                        | Research related skills                          |                        |
| CO3                        | Explain industrially importance of S.I. Engines. |                        |
| CO4                        | Apply concepts in practicals.                    |                        |

| <b>G) Scheme of Course Evaluation</b> |                                      |           |
|---------------------------------------|--------------------------------------|-----------|
| <b>1.</b>                             | End Semester Examination (ESE)       | 40        |
| <b>2.</b>                             | Continuous Internal Evaluation (CIE) | 10        |
| <b>3.</b>                             | <b>Total Marks</b>                   | <b>50</b> |

| <b>H) Suggested techniques for Continuous Internal Evaluation ( 10 Marks)</b> |                    |           |
|-------------------------------------------------------------------------------|--------------------|-----------|
| <b>1.</b>                                                                     | Home assignments   |           |
| <b>2.</b>                                                                     |                    |           |
| <b>3.</b>                                                                     |                    |           |
| <b>4.</b>                                                                     |                    |           |
| <b>5.</b>                                                                     | <b>Total Marks</b> | <b>10</b> |

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

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**Mahavir Mahavidyalaya, Kolhapur(Autonomous)**  
**Affiliated to Shivaji University, Kolhapur**  
**(New syllabus under Autonomy to be introduced from June, 2021 onwards)**

| <b>A) Primary Information:</b> |                                                |                |                  |
|--------------------------------|------------------------------------------------|----------------|------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc) AUTOMOBILE</b> |                |                  |
| Part                           | <b>I</b>                                       | Semester       | <b>I</b>         |
| Course                         | ENGINEERING DRAWING.                           | Course Code    | <b>BVC13</b>     |
| Paper No.                      | --                                             | Course Type    | <b>Semester</b>  |
| Total Marks                    | <b>50 Marks</b>                                | Implementation | <b>2021 - 22</b> |
| Total Credits                  | <b>03</b>                                      | Contact Hours  | <b>04 / Week</b> |
| Course Title                   | --                                             |                |                  |

| <b>B) Course Objectives:</b> |                                                    |
|------------------------------|----------------------------------------------------|
| i)                           | To acquire basic knowledge of Engineering Drawing. |
| ii)                          | To get broad knowledge in Engineering Drawing.     |
| iii)                         | To get interests in Engineering Drawing.           |
| iv)                          | To study details in Engineering Drawing.           |

| <b>C) Course Syllabi:</b><br>(CR = Credits / IH: Instructional Hours)                                                                                                                                                                                                                                                                                                                                                     |           |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>Units</b>                                                                                                                                                                                                                                                                                                                                                                                                              | <b>CR</b> | <b>IH</b> |
| <b>Unit I : Engineering Drawing fundamentals</b>                                                                                                                                                                                                                                                                                                                                                                          | 0.75      | 12        |
| 1.1 Importance of engineering drawing,                                                                                                                                                                                                                                                                                                                                                                                    |           |           |
| 1.2 Dimensioning- terms and notations as per BIS.                                                                                                                                                                                                                                                                                                                                                                         |           |           |
| 1. Scales - Study of scales - full size scale, reduced scale and enlarged scale,                                                                                                                                                                                                                                                                                                                                          |           |           |
| <b>Unit II : Curves</b>                                                                                                                                                                                                                                                                                                                                                                                                   | 0.75      | 12        |
| 2.1 Definition of locus, focus and directrix - Applications of ellipse, parabola and hyperbola.                                                                                                                                                                                                                                                                                                                           |           |           |
| 2.2 <b>Ellipse:</b> - Construction of ellipse by concentric circle method, rectangular method and Eccentricity method when focus and directrix are given<br><b>Parabola:</b> - Construction of parabola by rectangular method, eccentricity method when focus and directrix are given.<br><b>Hyperbola:</b> - Construction of hyperbola by rectangular method and eccentricity method when focus and directrix are given. |           |           |
| 2.3 construction of cycloid - epicycloid- hypocycloid                                                                                                                                                                                                                                                                                                                                                                     |           |           |
| 2.4. Involute of a circle - Archimedean spiral – helix.                                                                                                                                                                                                                                                                                                                                                                   |           |           |
|                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.75      | 12        |

|                                                                                                                                                                                                                                                                                                        |      |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| <b>Unit III : Projection of points &amp; lines</b>                                                                                                                                                                                                                                                     |      |    |
| 3.1 Projection of points - points in different quadrants. Projection of straight lines - parallel to one plane and perpendicular to other plane -inclined to one plane and parallel to the other plane - parallel to both the planes -inclined to both the planes (1 <sup>st</sup> angle method only). |      |    |
| <b>Unit IV : Orthographic Views &amp; Isometric projection</b>                                                                                                                                                                                                                                         |      |    |
| 4.1 Orthographic projection of the given pictorial view by 1 <sup>st</sup> angle method of projection only.                                                                                                                                                                                            |      |    |
| 4.2 Study of types of sections, sectional orthographic projections                                                                                                                                                                                                                                     |      |    |
| 4.3 Introduction to isometric axes , scale, isometric Projection & isometric views. Drawing isometric views of simple solids & objects, dimensioning -only length, width & height of isometric views.                                                                                                  | 0.75 | 12 |

|                                   |                                                                                                 |
|-----------------------------------|-------------------------------------------------------------------------------------------------|
| <b>D) Reference Materials</b>     |                                                                                                 |
| <b>D1) Text Books for Reading</b> |                                                                                                 |
| 1.                                | Engineering Drawing, Bhatt N.D. and Panchal V.M. Charotar Publishing House, 50th Edition, 2010. |
| <b>D2) Books for Reference</b>    |                                                                                                 |
| 1.                                | Engineering drawing Gill P.S., S.K.Kataria& Sons.                                               |
| 2.                                | Engineering Drawing Gopalakrishna K.R.," (Vol. I&II combined),                                  |
| 3.                                | Engineering Graphics Venugopal K. and Prabhu Raja V., New Age International.                    |

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

|                             |                                          |                        |
|-----------------------------|------------------------------------------|------------------------|
| <b>F) Course Outcomes :</b> |                                          | <b>Blooms Taxonomy</b> |
| CO1                         | Able to understand engineering drawings. |                        |
| CO2                         | Awareness in importance of drawings.     |                        |
| CO3                         | Apply concepts in practical.             |                        |

|                                       |                                      |           |
|---------------------------------------|--------------------------------------|-----------|
| <b>G) Scheme of Course Evaluation</b> |                                      |           |
| 1.                                    | End Semester Examination (ESE)       | 40        |
| 2.                                    | Continuous Internal Evaluation (CIE) | 10        |
| 3.                                    | <b>Total Marks</b>                   | <b>50</b> |

**H) Suggested techniques for Continuous Internal Evaluation ( 10 Marks)**

|    |                    |           |
|----|--------------------|-----------|
| 1. | Home assignments   |           |
| 2. |                    |           |
| 3. |                    |           |
| 4. |                    |           |
| 5. | <b>Total Marks</b> | <b>10</b> |

**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.     | <b>Total Marks</b>        | <b>40</b> |

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| <b>A) Primary Information:</b> |                                                  |                |                        |
|--------------------------------|--------------------------------------------------|----------------|------------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc.) AUTOMOBILE.</b> |                |                        |
| Part                           | <b>I</b>                                         | Semester       | <b>I</b>               |
| Course                         | Transmission System.                             | Course Code    | <b>Practical BVC11</b> |
| Paper No.                      | --                                               | Course Type    | <b>Semester</b>        |
| Total Marks                    | <b>50 Marks</b>                                  | Implementation | <b>2021 - 22</b>       |
| Total Credits                  | <b>05</b>                                        | Contact Hours  | <b>06 / Week</b>       |
| Course Title                   | --                                               |                |                        |

| <b>B) Course Objectives:</b> |                                                      |
|------------------------------|------------------------------------------------------|
| i)                           | To study the basics of Transmission system.          |
| ii)                          | To get details in transmission system .              |
| iii)                         | To develop awareness about faults in system.         |
| iv)                          | To study the basic work related to faults in system. |

| <b>C) Course Syllabi:</b><br>(CR = Credits / IH: Instructional Hours)                                  |           |           |
|--------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>Practicals</b>                                                                                      | <b>CR</b> | <b>IH</b> |
| 1. Inspecting the transmission system for fault detection                                              | 05        | 75        |
| 2 Testing of Clutch for slip, clutch noise, power loss, setting of clutch                              |           |           |
| 3 Dismantling and assembly of clutch.                                                                  |           |           |
| 4 Testing of gear box for noise, oil leak, shifting                                                    |           |           |
| 5 Overhauling constant mesh gearbox, synchromesh gearbox                                               |           |           |
| 6 Testing of CVT.                                                                                      |           |           |
| 7 Dismantling-cleaning-inspection-assembling of final drive, differential and axle shafts              |           |           |
| 8 Inspection, checking and replacement of wheel bearings                                               |           |           |
| 9 Checking of wheels and tyres for noise, wear and tear. Replacement of wheels & Replacement of tyres. |           |           |

| <b>D) Suggested methods of Teaching:</b> |                                       |
|------------------------------------------|---------------------------------------|
| i)                                       | Online teaching/ Offline / Internship |
| ii)                                      | Power point presentation/ Seminars    |
| iii)                                     | Group discussion/ Hands on training   |
| iv)                                      | Demonstration/ Industrial training    |

| <b>E) Course Outcomes:</b> |                                             | <b>Blooms Taxonomy</b> |
|----------------------------|---------------------------------------------|------------------------|
| CO1                        | Apply the knowledge of transmission system. |                        |
| CO2                        | Apply the knowledge clutches & gear box.    |                        |
| CO3                        | Apply the knowledge final drive.            |                        |
| CO4                        | Apply concepts of differential.             |                        |

| <b>F) Scheme of Course Evaluation</b> |                                      |           |
|---------------------------------------|--------------------------------------|-----------|
| 1.                                    | End Semester Examination (ESE)       | 40        |
| 2.                                    | Continuous Internal Evaluation (CIE) | 10        |
| 3.                                    | <b>Total Marks</b>                   | <b>50</b> |

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

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**(New syllabus under Autonomy to be introduced from June, 2021 onwards)**

| <b>A) Primary Information:</b> |                                                  |                |                        |
|--------------------------------|--------------------------------------------------|----------------|------------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc.) AUTOMOBILE.</b> |                |                        |
| Part                           | <b>I</b>                                         | Semester       | <b>I</b>               |
| Course                         | Engineering Drawing.                             | Course Code    | <b>Practical BVC12</b> |
| Paper No.                      | --                                               | Course Type    | <b>Semester</b>        |
| Total Marks                    | <b>50 Marks</b>                                  | Implementation | <b>2021 - 22</b>       |
| Total Credits                  | <b>05</b>                                        | Contact Hours  | <b>06 / Week</b>       |
| Course Title                   | <b>--</b>                                        |                |                        |

| <b>B) Course Objectives:</b> |                                                 |
|------------------------------|-------------------------------------------------|
| i)                           | To study the basics of Engineering drawing.     |
| ii)                          | To get details in Engineering drawing.          |
| iii)                         | To develop awareness about Engineering drawing. |
| iv)                          | To draw basic work related Engineering drawing. |

| C) Course Syllabi:<br>(CR = Credits / IH: Instructional Hours)                                                                                                                                                                 |                                                                      |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|----|
| Practicals                                                                                                                                                                                                                     | CR                                                                   | IH |
| 1. <b>Geometrical Constructions</b> (1Sheet)<br>Draw the following figures with dimensions- Rectangle, circle, pentagon, hexagon, and two composite figures involving tangential exercises.                                    | 05                                                                   | 75 |
| 2. <b>Engineering curves &amp; Loci of points</b> -(3 Sheet)<br>i) Three different curves are to be draw using any one method.<br>ii) Draw locus of point on any one mechanism<br>iii) Draw cycloid, epicycloids and hypocloid |                                                                      |    |
| 3. <b>Orthographic projections</b> -(Total 2 Sheets)<br>Two objects by first angle projection method–<br>- Full orthographic views - One sheet<br>- Sectional orthographic views – One sheet                                   |                                                                      |    |
| 4. <b>Isometric projection</b> -(Total 02 sheets)<br>- Isometric views of two objects-One sheet<br>- Isometric projection of two objects–One sheet                                                                             |                                                                      |    |
| <b>D) Reference Materials</b>                                                                                                                                                                                                  |                                                                      |    |
| <b>D1) Text Books for Reading</b>                                                                                                                                                                                              |                                                                      |    |
| 1.                                                                                                                                                                                                                             | Engineering Drawing, Bhatt N.D. and Panchal V.M. Charotar Publishing |    |

|                                |                                                                              |
|--------------------------------|------------------------------------------------------------------------------|
|                                | House, 50th<br>Edition, 2010.                                                |
| <b>D2) Books for Reference</b> |                                                                              |
| 1.                             | Engineering drawing Gill P.S., S.K.Kataria& Sons.                            |
| 2.                             | Engineering Drawing Gopalakrishna K.R.,” (Vol. I&II combined),               |
| 3.                             | Engineering Graphics Venugopal K. and Prabhu Raja V., New Age International. |

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

|                            |                                          |                        |
|----------------------------|------------------------------------------|------------------------|
| <b>F) Course Outcomes:</b> |                                          | <b>Blooms Taxonomy</b> |
| CO1                        | Able to understand engineering drawings. |                        |
| CO2                        | Awareness in importance of drawings.     |                        |
| CO3                        | Apply concepts in practical.             |                        |

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

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**Mahavir Mahavidyalaya, Kolhapur(Autonomous)**  
**Affiliated to Shivaji University, Kolhapur**  
**(New syllabus under Autonomy to be introduced from June, 2021 onwards)**

| <b>A) Primary Information:</b> |                                                 |                |                            |
|--------------------------------|-------------------------------------------------|----------------|----------------------------|
| Programme                      | <b>Bachelor of Vocation(B. Voc.) AUTOMOBILE</b> |                |                            |
| Part                           | <b>I</b>                                        | Semester       | <b>I</b>                   |
| Course                         | <b>WORKSHOP</b>                                 | Course Code    | <b>Practical<br/>BVC13</b> |
| Paper No.                      | <b>--</b>                                       | Course Type    | <b>Semester</b>            |
| Total Marks                    | <b>50 Marks</b>                                 | Implementation | <b>2021 - 22</b>           |
| Total Credits                  | <b>05</b>                                       | Contact Hours  | <b>06 / Week</b>           |
| Course Title                   | <b>--</b>                                       |                |                            |

| <b>B) Course Objectives:</b> |                                |
|------------------------------|--------------------------------|
| i)                           | To get plumbing knowledge.     |
| ii)                          | To get sheet metal knowledge.  |
| iii)                         | To get wood working knowledge. |
| iv)                          | To get welding knowledge.      |
| V)                           | To get turning knowledge.      |

| <b>C) Course Syllabi:</b><br>(CR = Credits / IH: Instructional Hours)                                                                                                                                                                                                                                                                                               |           |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|
| <b>Practicals</b>                                                                                                                                                                                                                                                                                                                                                   | <b>CR</b> | <b>IH</b> |
| <b>1. PLUMBING SHOP:</b><br>1. Demonstration of different plumbing tools<br>2. Demonstration of different operations in plumbing, observing different pipe joints and pipe accessories. Different samples of PVC pipes and PVC pipe fittings.<br>3. One job on simple pipe joint with nipple coupling for standard pipe.<br>Pipe threading using standard die sets. | 05        | 75        |
| <b>2.SHEET METAL SHOP:</b><br>1. Demonstration of different sheet metal tools / machines.<br>2. Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering and riveting.<br>3. One simple job involving sheet metal operations and soldering and riveting.                                              |           |           |
| <b>3.WOOD WORKING SHOP:</b><br>1. Demonstration of different wood working tools / machines.<br>2. Demonstration of different wood working processes, like planning, marking, chiseling, grooving, turning of wood etc.                                                                                                                                              |           |           |

|                                                                                                                                                                                                                                                                                       |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| 3. One simple job involving any one joint like mortise and tenon dovetail, bridle, half lap etc.                                                                                                                                                                                      |  |  |
| <b>4.WELDING SHOP:</b><br>1. Demonstration of different welding tools / machines.<br>2. Demonstration on Arc Welding, Gas Welding, gas cutting and rebuilding of broken parts with welding.<br>3. One simple job involving butt and lap joint.                                        |  |  |
| <b>5.TURNING SHOP</b><br>1. Demonstration of turning, threading operation<br>2. One job related to Plane and Taper turning, threading and knurling.                                                                                                                                   |  |  |
| <b>6. FITTING SHOP:</b><br>1. Demonstration of different fitting tools and drilling machines and power tools.<br>2. Demonstration of different operations like chipping, filing, drilling, tapping, cutting etc.<br>3. One simple fitting job involving practice of chipping, filing, |  |  |

| <b>D) Suggested methods of Teaching:</b> |                                       |
|------------------------------------------|---------------------------------------|
| i)                                       | Online teaching/ Offline / Internship |
| ii)                                      | Power point presentation/ Seminars    |
| iii)                                     | Group discussion/ Hands on training   |
| iv)                                      | Demonstration/ Industrial training    |

| <b>E) Course Outcomes:</b> |                                   | <b>Blooms Taxonomy</b> |
|----------------------------|-----------------------------------|------------------------|
| CO1                        | Done with plumbing knowledge.     |                        |
| CO2                        | Done with sheet metal knowledge.  |                        |
| CO3                        | Done with wood working knowledge. |                        |
| CO4                        | Done with welding knowledge.      |                        |
| CO5                        | Done with turning knowledge.      |                        |

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

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