

| RGPV (DIPLOMA WING)<br>BHOPAL |  | OBE CURRICULUM FOR THE<br>COURSE |                                     | FORMAT-3  |       |
|-------------------------------|--|----------------------------------|-------------------------------------|-----------|-------|
| Branch                        | Mechanical Engineering   |                                  |                                     | Semester  | VI    |
| Course Code                   | 60_  | Course Name                      | <u>Farm Equipment and Machinery</u> |           |       |
| <b>Course Outcome 1</b>       | Calculate field capacity, efficiency, economic parameters of machine uses for farming operations.  |                                  |                                     | Teach Hrs | Marks |
| <b>Learning Outcome 11</b>    | Explain farming operations, machines.  |                                  |                                     | 6         | 10    |
| <b>Contents</b>               | Farm mechanization. Farm machines and its classification. Machines for seed bed preparation, tilling, sowing, plant protection and irrigation, cutting, threshing operations on the farm. Hitching systems and controls of farm machinery.                             |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of TW</b> )  |                                  |                                     |           |       |
| <b>Learning Outcome 12</b>    | Calculate field capacity, efficiency, economic parameters of machine uses for a given farming operation.   |                                  |                                     | 8         | 10    |
| <b>Contents</b>               | Calculation of field capacities and field efficiency. Calculations for economics of machinery usage: Fixed cost, variable cost, depreciation, estimated value method, straight line method, declining balance method. Comparison of ownership with hiring of machines. |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of External Theory Exam</b> )  |                                  |                                     |           |       |
| <b>Course Outcome 2</b>       | Student will be able to calculate draft of tilling tool, power requirement of tilling machine.   |                                  |                                     | Teach Hrs | Marks |
| <b>Learning Outcome 21</b>    | Explain process of seed-bed preparation, land reclamation.   |                                  |                                     | 4         | 8     |
| <b>Contents</b>               | Introduction to seed-bed preparation, its classification. Land reclamation and earth moving equipment.   |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Progressive Test 1</b> )  |                                  |                                     |           |       |
| <b>Learning Outcome 22</b>    | Calculate draft of tillage tool, power requirement for tilling operations.   |                                  |                                     | 6         | 10    |
| <b>Contents</b>               | Machines used for primary tillage, secondary tillage, rotary tillage, deep tillage and minimum tillage. Measurement of draft of tillage tools and calculations for power requirement for tilling machines.   |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Laboratory Test by Observation ( <b>Part of External Practical Exam</b> )  |                                  |                                     |           |       |
| <b>Learning Outcome 23</b>    | Identify implements, major functional components used in tilling operations.   |                                  |                                     | 5         | 8     |
| <b>Contents</b>               | Tillage machines like mould-board plough, disc plough, chisel plough, sub-soiler, harrows, puddler, cultivators, identification of major functional components. Attachments with tilling machinery.  |                                  |                                     |           |       |

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| <b>Method of Assessment</b>   | Laboratory Test by Observation ( <b>Part of Internal Practical</b> )  |                                  |                                     |           |       |
| <b>Course Outcome 3</b>       | Explain construction, working of sowing, planting, transplanting equipment.   |                                  |                                     | Teach Hrs | Marks |
| <b>Learning Outcome 31</b>    | Explain construction, working of sowing equipment for a crop.   |                                  |                                     | 8         | 10    |
| <b>Contents</b>               | Sowing, equipment. Construction and working of seed drills, no-till drills, and strip-till drills.  |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |       |
| <b>Learning Outcome 32</b>    | Explain construction, working of planting , transplanting equipment for a crop  |                                  |                                     | 8         | 10    |
| <b>Contents</b>               | Introduction to planters, bed planters and other planting/transplanting equipment like sugarcane, potato, groundnut, water chestnut, paddy.                             |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |       |
| <b>Learning Outcome 33</b>    | Explain metering, calibration systems used in sowing equipment.   |                                  |                                     | 8         | 10    |
| <b>Contents</b>               | Study of types of furrow openers and metering systems in drills and planters. Calibration of seed-drills/ planters. Adjustments during operation.                       |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |       |
| <b>Course Outcome 4</b>       | Explain construction, working of crop harvesting equipment  |                                  |                                     | Teach Hrs | Marks |
| <b>Learning Outcome 41</b>    | Explain construction, working of cutting equipment for a crop.  |                                  |                                     | 8         | 12    |
| <b>Contents</b>               | Cutting mechanism, shear and impact cutting; Cutting machines: mowers, windrowers, reapers, reaper binders and forage harvesters. Forage chopping & handling equipment. |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Progressive Test 2</b> )   |                                  |                                     |           |       |
| <b>Learning Outcome 42</b>    | Explain construction, working of threshing equipment for a crop.  |                                  |                                     | 8         | 10    |
| <b>Contents</b>               | Threshing mechanics, threshers and its types. Straw combines, grain combines.   |                                  |                                     |           |       |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |       |

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| <b>Learning Outcome 43</b>    | Explain construction, working of harvesting equipment for a crop.   |                                  |                                     | <b>8</b>  | <b>10</b> |
| <b>Contents</b>               | Maize harvesting & shelling equipment, Root crop harvesting equipment - potato, groundnut etc., Cotton picking & Sugarcane harvesting equipment.  |                                  |                                     |           |           |
| <b>Method of Assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |           |
| <b>Course Outcome 5</b>       | Select a suitable farm machine.   |                                  |                                     | Teach Hrs | Marks     |
| <b>Learning Outcome 51</b>    | Explain materials, heat treatment processes for farm machinery.   |                                  |                                     | <b>8</b>  | <b>10</b> |
| <b>Contents</b>               | Materials used in farm machine components. Steels and alloys for agricultural application. Heat treatment processes for farm machine components.  |                                  |                                     |           |           |
| <b>Method of assessment</b>   | Test Paper + Rating Scale ( <b>Part of Theory External Exam</b> )   |                                  |                                     |           |           |
| <b>Learning Outcome 52</b>    | Explain test procedure of a farm machine selection.   |                                  |                                     | <b>6</b>  | <b>12</b> |
| <b>Contents</b>               | Testing of farm machine. Test codes & procedure. Interpretation of test results. Selection and management of farm machines for optimum performance.   |                                  |                                     |           |           |
| <b>Method of Assessment</b>   | Laboratory Test by Observation ( <b>Part of Internal Lab Work</b> )   |                                  |                                     |           |           |
| <b>Learning Outcome 53</b>    | Supervise periodic maintenance, repair work of farm equipment, farm machinery.  |                                  |                                     | <b>8</b>  | <b>10</b> |
| <b>Contents</b>               | Familiarization of components, components for periodic maintenance, adjustments, periodic maintenance, repair of components of- tillage machinery, seeding machinery, harvesting machinery, threshing machinery, plant protection and irrigation equipment. |                                  |                                     |           |           |
| <b>Method of Assessment</b>   | Laboratory Test by Observation ( <b>Part of External Practical Exam</b> )   |                                  |                                     |           |           |
| <b>Learning Outcome 54</b>    | Supervise periodic maintenance, repair work of tractor.   |                                  |                                     | <b>6</b>  | <b>10</b> |
| <b>Contents</b>               | Operation of tractor, attachment and adjustment of hitching system. Periodic maintenance of air cleaning, fuel supply, lubrication, cooling systems. Engine trouble shooting: problems, causes and remedies.  |                                  |                                     |           |           |
| <b>Method of Assessment</b>   | Laboratory Test by Observation ( <b>Part of External Practical Exam</b> )   |                                  |                                     |           |           |