



UNIVERSITI TEKNOLOGI MARA

AGR318: MECHANIZATION OF ESTATE OPERATION

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| Course Name (English) | MECHANIZATION OF ESTATE OPERATION APPROVED |
| Course Code | AGR318 |
| MQF Credit | 3 |
| Course Description | This course will provides an overview of mechanization in estate operations,as well as the fundamental knowledge of internal combustion engine constructions, farm tractors and method to select the farm implement for attachment. Beside that introduction to various farm crop production equipment and irrigation systems were also provided. |
| Transferable Skills | Communication skills (listening, verbal, written and providing feedback), Ability to adapt new norms, Research skills, Analytical skills, Numeracy skills, Problem solving, Data analysis, Time management, Clerical skills & Computer and technical skills. |
| Teaching Methodologies | Lectures, Blended Learning, Case Study, Web Based Learning, Presentation, Directed Self-learning |
| CLO | CLO1 Describe the basic concept of mechanization in agriculture and apply the knowledge for farm machinery selection in estate operations, including the crop production equipment and irrigation system. CLO2 Explain and demonstrate the engine components and its support systems. CLO3 Develop the mechanization plan for an estate. |
| Pre-Requisite Courses | No course recommendations |
| Topics | |
| 1. Estate mechanization 1.1) Introductions 1.2) History of mechanized agriculture 1.3) The necessity of estate mechanization | |
| 2. Tractors for mechanized estate operations 2.1) Development of tractors 2.2) Types of tractors 2.3) Functions of farm tractors 2.4) Three-point linkage of tractors 2.5) Safety rules | |
| 3. Engine constructions and components 3.1) Internal combustion engines 3.2) Four-stroke and two-stroke cycle engine 3.3) Diesel engine 3.4) Petrol engine 3.5) Engine cylinder 3.6) Engine valves 3.7) Piston assemblies 3.8) Crankshaft and flywheels | |

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| <p>4. Engine lubrication systems</p> <p>4.1) Types and properties of lubricants 4.2) Lubrication oil systems 4.3) Oil filter 4.4) Oil viscosity and its classifications</p> |
| <p>5. Engine cooling systems</p> <p>5.1) Basic functions of engine cooling system 5.2) Air cooling system 5.3) Water cooling system 5.4) Radiator 5.5) Thermostat 5.6) Coolant</p> |
| <p>6. Fuel and electrical systems</p> <p>6.1) Fuel types 6.2) Principle of carburetor 6.3) Diesel fuel 6.4) Petrol fuel system 6.5) Engine ignition 6.6) Electrical system components</p> |
| <p>7. Power transmission and hydraulic system</p> <p>7.1) Basic principle of transmission 7.2) Mechanical transmission 7.3) Hydrostatic transmission 7.4) Differentials 7.5) Final drives 7.6) Power take off (PTO) drives 7.7) Basic principles of hydraulic 7.8) Hydraulic components</p> |
| <p>8. Machines and equipment for mechanized estate operations</p> <p>8.1) Tillage equipment 8.2) Fertilizing equipment 8.3) Planting machines 8.4) Crop protection machines 8.5) Harvesting machines 8.6) Transporting machines</p> |
| <p>9. Irrigation and drainage</p> <p>9.1) Importance of irrigation 9.2) Sprinkler irrigation 9.3) Drip irrigation</p> |
| <p>10. Machinery selection and management</p> <p>10.1) Introduction to machinery management 10.2) Field capacity and efficiency 10.3) Estimating power requirements 10.4) Machinery costs</p> |

| Assessment Breakdown | % |
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| Continuous Assessment | 60.00% |
| Final Assessment | 40.00% |

| Details of Continuous Assessment | Assessment Type | Assessment Description | % of Total Mark | CLO |
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| | Online Quiz | Quizzes | 20% | CLO1 |
| | Presentation | Virtual Presentation | 20% | CLO3 |
| | Written Report | Task Performance | 20% | CLO2 |

| Reading List | Recommended Text |
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| | <ul style="list-style-type: none"> • Claude Culpin 1992, <i>Farm Machinery</i>, 3rd edition Ed., Blackwell Publishers • Brian Bell 1996, <i>Farm Machinery</i>, Farming Press Book United Kingdom • Donnel R. Hunt 1999, <i>Farm Power and Machinery Management</i>, 9th edition Ed. |

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| Article/Paper List | This Course does not have any article/paper resources |
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| Other References | This Course does not have any other resources |
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