

Course	CO	Statements	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
FMP 501, Design of Farm Power and Machinery, 3+1														
	FMP 501.1	Acquaintance with research and development procedures in farm equipment and tractors.	3	3	3	3	3	2	2	1	3	3	3	3
	FMP 501.2	Design of farm machinery.	3	2	3	3	3	1	3	3	1	3	3	3

	FMP 501.3	Analysis of linkages in farm machinery.	2	1	3	3	2	1	3	3	3	3	1	3
	FMP 501.4	Reliability criteria in design.	3	1	2	2	3	3	1	3	3	3	3	3
FMP 502, Soil dynamics in tillage and traction, 2+1														
	FMP 502.1	Understanding of dynamic properties of soil in relation to tillage and traction.	3	2	3	2	3	3	1	2	2	3	3	3

	FMP 503.1	Acquaintance with testing types, procedures and various codes.	3	3	2	3	2	3	1	3	3	3	3	3
	FMP 503.2	Laboratory and field testing of selected farm equipment.	2	2	3	3	3	3	3	2	2	2	2	3
	FMP 503.3	Tractor testing, performance evaluation and interpretation.	3	3	3	2	1	2	2	2	3	2	3	3
	FMP 503.4	Review and interpretation of test reports.	2	2	3	3	3	3	2	2	3	3	2	2

<p style="color: red;">FMP 504, System Simulation and Computer Aided Problem Solving in Engineering, 1+1</p>															
	<p>FMP 504.1</p>	<p>Dimensional analysis for simulation.</p>	3	3	3	2	3	3	2	2	3	3	3	3	3
	<p>FMP 504.2</p>	<p>Mathematical modeling and engineering problem solving.</p>	2	3	3	2	3	2	3	3	3	3	3	3	2
	<p>FMP 504.3</p>	<p>Algorithm design, program composition and quality control.</p>	3	2	3	2	1	2	3	3	3	3	3	3	2

	FMP 504.4	Solving differential equations on computers-modeling engineering systems.	3	2	2	3	2	2	2	3	3	3	3	3
FMP 505 Applied Instrumentation in Farm Machinery and Stress Analysis, 2+1														
	FMP 505.1	Analyse stress strain relationships.	3	2	3	1	3	2	2	2	3	2	3	3
	FMP 505.2	Acquaintance with measuring devices for displacement, velocity, force, torque and power.	3	2	3	2	1	3	3	3	3	3	3	3

	FMP 505.3	Acquaintance with devices for measurement of temperature, relative humidity, pressure, sound, vibration, flow etc.	3	2	2	3	3	2	2	3	3	2	3	3
	FMP 505.4	Basic signal conditioning devices. Data acquisition system, micro computers.	3	2	1	3	3	2	2	3	3	3	3	3
FMP 506 Farm Machinery Management and System Engineering, 2+1														
	FMP 506.1	Cost analysis of Farm Machinery as a system.	3	2	3	2	1	3	3	3	3	3	3	2

	FMP 507.1	Knowledge of principles of soil working tools.	3	2	2	3	3	2	2	3	3	2	3	2
	FMP 507.2	Acquaintance with theory of atomization, and mechanical separation.	3	2	1	3	2	2	2	3	3	3	3	3
	FMP 507.3	Knowledge of different types of vibrations.	3	2	3	2	1	2	3	3	3	3	3	3
	FMP 507.4	Ability to balance reciprocating systems.	3	2	3	3	2	2	2	3	3	2	3	3

<p style="color: red;">FMP 508 Tractor Design, 2+1</p>															
	<p>FMP 508.1</p>	<p>Familiarity with the technical specifications and modern trends in development of tractors in India.</p>	3	2	2	2	1	2	3	2	3	3	3	3	3
	<p>FMP 508.2</p>	<p>Understanding of the parameters affecting design of tractor engine and their selection</p>	3	2	2	3	3	3	3	2	2	2	3	2	2
	<p>FMP 508.3</p>	<p>Ability to design of fuel efficient engine components and tractor systems</p>	2	3	2	2	2	2	3	2	3	2	2	2	3

	FMP 509.1	Ability to identify and utilize Human factors in system development.	2	3	2	3	3	2	2	2	3	3	2	2
	FMP 509.2	Understanding of the energy liberation and mechanical efficiency of human body	3	2	2	2	3	2	2	3	3	2	2	2
	FMP 509.3	Knowledge of anthropometry and biomechanics	2	2	3	3	2	2	3	3	2	2	3	2
	FMP 509.4	Familiarity with the man-machine system concept, human behavior models.	3	3	2	2	2	3	3	2	2	3	3	2

	FMP 509.5	Hands-on practice on ergonomics in agricultural machines.	3	3	2	2	3	3	2	3	3	2	2	3
FMP 510 Engineering Properties of Biological Material, 2+1														
	FMP 510.1	Understanding the physical characteristics-of different food grains, fruits and vegetables	2	2	3	3	3	3	2	2	3	3	2	2
	FMP 510.2	Understanding the ASTM standards, classical ideal material, etc.	3	2	3	2	2	2	3	3	3	3	3	3

	FMP 511.1	Understanding the energy resources on the farm; conventional and non-conventional forms of energy and their use.	2	3	2	3	2	3	3	2	2	3	3	3
	FMP 511.2	Understanding the heat equivalents and energy coefficients for different agricultural inputs and products.	2	2	3	3	2	3	2	3	2	3	3	3
	FMP 511.3	Proficiency in pattern of energy consumption and their constraints in production of agriculture.	3	3	2	2	3	3	2	2	2	3	3	3
	FMP 511.4	Familiarity with the energy audit of production agriculture	3	3	3	3	3	2	2	2	3	2	2	2

	FMP 511.5	Knowledge of identification of energy efficient machinery systems, energy losses and their management.	3	3	2	2	3	3	2	3	2	3	3	3
	FMP 511.6	Skills in energy forecasting, energy economics, energy pricing and incentives for energy conservation. Energy modelling.	2	3	2	3	2	3	3	3	2	2	3	3
FMP 512 Design and Analysis of Renewable Energy Conversion Systems, 3+0														
	FMP 512.1	Understanding the energy cycle of the earth	3	3	2	2	2	2	2	3	2	2	2	2

	FMP 512.2	Understanding the energy heat flow and energy storage	2	3	2	2	2	3	2	3	2	2	2	2
	FMP 512.3	Familiarity with the thermodynamics of energy conversion	3	2	3	3	2	3	3	3	3	2	2	2
	FMP 512.4	Knowledge of usage of biogas, alcohols and plant oils, plant- oil-esters in I.C. engines	3	3	2	2	3	3	3	2	3	3	2	2
	FMP 512.5	Proficiency in studying parameters for measuring the performance of the I.C. engines.	2	2	2	2	3	3	2	3	2	3	3	3

	FMP 512.6	Ability to design bio-fuel production units	2	3	3	2	2	3	3	2	2	3	3	3
FMP 513 Theory of Hydraulics and its Applications, 2+1														
	FMP 513.1	Understanding fluid power, its advantages, and properties of hydraulic fluids.	3	3	2	2	3	2	2	3	2	2	3	3
	FMP 513.2	Understanding the concepts of energy in hydraulic systems, laws of fluid flow	3	3	3	3	3	2	3	2	3	2	2	2

	FMP 513.3	Familiarity with the pressure distribution system of tubing and hoses coupling etc.	2	3	2	3	2	3	3	2	2	3	3	3
	FMP 513.4	Familiarity with the basics of hydraulic flow and hydraulic circuit analysis	2	2	3	3	2	3	2	2	2	3	3	3
	FMP 513.5	Knowledge of tractor hydraulic systems, tractor power steering and brake system.	3	3	2	2	3	3	2	3	2	3	3	3
	FMP 513.6	Hands-on practice of tractor hydraulic systems for agricultural equipment .	2	2	3	3	2	3	2	2	2	3	3	3

	FMP 513.7	Hands-on practice of performance characteristics of hydraulic components, circuit's analysis, fluid properties, analogies.	2	2	3	3	2	3	2	2	2	3	3	3
FMP 601 Advances in Farm Machinery and Power Engineering, 3+0														
	FMP 601.1	Ability to understand farm machinery as a system.	2	2	3	3	3	2	2	3	3	2	2	2
	FMP 601.2	Understanding of the dynamic characteristics of related components of engine and agricultural machines	3	2	3	3	2	2	3	3	2	2	2	3

	FMP 601.3	Proficiency in dealing with engineering problems	3	3	2	2	2	3	3	3	2	2	2	3
	FMP 601.4	Capability to design mechanical power transmission systems using computer tools. .	3	2	2	2	2	2	2	3	3	2	2	3
	FMP 601.5	Knowledge of force analysis in tractor-implement combination	3	3	2	2	2	2	2	2	3	2	2	3
	FMP 601.6	Hands-on practice of checking, interpretation and statistical analysis of results.	3	2	3	3	2	2	3	3	3	3	2	3

<p>FMP 602 Mathematical Modeling in Farm Machinery and Power Engineering, 3+0</p>														
	<p>FMP 602.1</p>	<p>Knowledge of mathematical modeling, its classifications, characteristics and approach and limitations</p>	<p>3</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>3</p>	<p>2</p>	<p>2</p>
	<p>FMP 602.2</p>	<p>Understanding of the dimensional homogeneity, Buckingham pi-theorem</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>
	<p>FMP 602.3</p>	<p>Proficiency in similitude in tillage tool studies, prediction models for traction devices</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>2</p>	<p>2</p>	<p>3</p>	<p>3</p>	<p>2</p>	<p>3</p>	<p>3</p>	<p>2</p>

	FMP 602.4	Familiarity with the probability theory, analysis of random data	3	2	2	3	2	3	3	2	2	2	3	2
	FMP 602.5	Hands-on practice on formulation and analysis of models	3	2	2	2	3	3	2	3	2	2	2	3
	FMP 602.6	Ability to identify and differentiate between deterministic and stochastic.	2	3	2	2	2	3	2	2	3	2	2	3
	FMP 602.7	Skills in application of modeling in farm machinery.	3	3	3	3	2	3	2	2	2	3	2	2

<p style="text-align: center;">FMP 603 Energy Conservation and Management in Production Agriculture, 2+0</p>															
	FMP 603.1	Ability to compute the energy requirement in production agriculture, including crop, livestock, and aquaculture.	3	2	2	3	3	2	3	3	2	2	3	3	
	FMP 603.2	Understanding of the planning and management of agricultural production systems for energy conservation	2	3	3	3	2	3	3	3	2	3	2	3	
	FMP 603.3	Proficiency in energy returns assessment	2	3	3	3	2	2	3	2	3	2	3	3	

	FMP 604.1	Ability to design farm machinery components using CAD.	3	2	2	3	3	3	2	2	2	3	3	3
	FMP 604.2	Understanding of the relevance of system approach to biological systems and engineering systems	3	2	3	3	2	2	3	2	3	3	2	3
	FMP 604.3	Proficiency in design of a system and development of computer systems	2	2	3	2	2	3	2	2	3	2	2	3
	FMP 604.4	Familiarity with the characteristics of agricultural systems	3	3	2	3	2	3	2	2	2	2	3	2

	FMP 604.5	Knowledge of tools of structured analysis	3	2	2	3	2	3	3	2	2	3	2	3
FMP 605 Machinery for Natural Resource Management and Precision Farming, 3+1														
	FMP 605.1	Understanding of the functional design, specifications, requirements and working of farm machinery for natural resources management	3	3	3	2	2	3	2	3	2	2	3	3
	FMP 605.2	Understanding Ag GPS parallel swathing option, database management, functional systems documentation.	3	3	3	2	3	2	2	3	3	2	3	2

	FMP 605.3	Understanding precision farming. GIS/ GPS system for precision farming	2	3	2	3	3	3	3	2	2	3	3	2
	FMP 605.4	Familiarity with the Yield monitoring and mapping, soil sampling and analysis	2	3	3	3	2	2	3	3	2	3	2	3
	FMP 605.5	Knowledge of Precision farming-Issues and conditions	3	2	2	3	3	2	2	3	3	2	2	3
	FMP 605.6	Ability to apply PERT and CPM to the problems related to land development identify and differentiate between	3	3	2	2	3	3	2	2	3	3	2	3
	FMP 605.7	Skills in electronics in farm machinery for precision farming.	3	2	3	2	2	2	3	3	3	2	2	3