

• M. Tech. Renewable Engineering

Basic Supporting Courses

S. No.	Course Code	Course Title	L-T-P	Credits
1.	COMP 805	Computer Programming	2-0-1	3
2.	MAS 711	Statistics -I	2-0-1	3
3.	MAS 715	Statistics –II	2-0-1	3
4.	MAS 701	Advanced Engineering Mathematics	3-0-0	3

Core Courses

S. No.	Course Code	Course Title	L-T-P	Credits
1.	FMP 700	Research Institution / Industrial Visit	0-0-1	1
2.	FMP 751	Energetics of Agricultural Production & Agro-processing Industries	2-0-0	2
3.	FMP 780	Seminar -I	0-0-1	1
4.	FMP 851	Advances in Biomass & Solar Energy Conversion	2-0-0	2
5.	ME 703	Solid Waste Management for Energy Production	3-0-0	3
6.	ME 704	Energy Economics and Management in Agricultural Systems	2-1-0	3
7.	FMP 800	Field /Industrial Training	0-0-1	1
8.	FMP 880	Seminar -II	0-0-1	1
9.	FMP 899	Dissertation	0-0-15	15

Specialized Courses

S. No.	Course Code	Course Title	L-T-P	Credits
1.	FMP 752	Biomass Energy Conversion Systems	3-0-0	3
2.	ME 701	Solar Energy Technology	2-0-1	3
3.	ME 702	Wind, Geothermal and Tidal Energy	2-0-1	3
4.	FMP 706	Alternative Energy Sources	2-0-1	3
5.	FMP 753	Bio Fuels Production and Utilization	2-0-1	3

Basic Supporting Courses

COMP 805 Computer Programming

3 (2-0-1)

Algorithms & Flow Charts, C programming :Preliminaries, Constants & Variables, Arithmetic Expressions, Input- Output statements, Control Statements, Do-Statements, Subscripted variables, Elementary Format Specifications, Logical Statements & Decision Tables, Function & Subroutines Computer Oriented Numerical Methods: Solution of Non Linear Equation, Bisection Method, Newton Method, Numerical Integration, Trapezoidal Method, Simpson's 1/3 & 3/8 rule , Curve Fitting, Construction of forward, backward difference table, Interpolation Application of statistical packages

MAS 711 Statistics – I

3 (2-0-1)

Standard – deviation, coefficient of variation, standards error of mean

Theory of probability : equally likely, mutually exclusive events, definitions of probability, additions & multiplication theorems of probability and problems based on them. Normal & Binomial distributions. Simple correlation & regression, multiple – regression, multiple & partial – correction.

Testing of hypothesis : Concept of Hypothesis, Degree of freedom, levels of significance. Type I & Type II errors X^2 , t, Z & F – Tests. (definition, applications & Problems based on these tests).

MAS 715 Statistics – II

3 (2-0-1)

Analysis of variance techniques : Definition and assumptions, one way classification, two way classification with more than one observation per cell.

Design of experiment : Principles of Experimental – Design, Randomized Block Design (R.B.D.), Latin Square Design (LSD), missing plot technique in RBD and LSD, Critical difference (CD) split plot design. Factorial – Experiments 2^2 , 2^3 , 3^2 & 3^3 , Factorial – Designs (Yates method of Analysis), 2×3 & 2×4 factorials. Durcan's Multipler Range Test. Newman's Kuel's Test.

Sampling techniques : Simple Random Sampling, stratified Random Sampling & Systematic Sampling.

MAS 701 Advanced Engineering Mathematics

4 (3-1-0)

Gamma, Beta and Legendre's functions, Euler's equations, Lang-range equations, the Ritz method, the Greens functions. Bolazane Weirestrass theorem in finite products. Laplace transforms, Inverse Laplace Transforms and application to differential equations, Fourier series, Fourier transforms, Solution of non linear algebraic and transcendental equation by regula Falsi method. Newton Raphson method.

Newton forward and backward interpolation formula, divided differences. Trapezoidal Rule, Simpsons 1/3 rule, numerical solution of ordinary differential equations by Runge Kutta Method, Picards equations.

FMP 753 Bio fuels Production and Utilization

3 (2-0-1)

Biomass and its types; Biomass Production fuel related properties of biomass; planning and management of biomass collection, utilization, handling and pre-conditioning processes such as size reduction and densification; combustion, pyrolysis and gasification of biomass, photosynthetic efficiency, plant productivity and bio-energy yield, biomass waste;. Chemistry, process and performance analysis; alcohol production: pre-treatment of biomass, fermentation with process details and dehydration; operational performance of I.C. engines on producer gas, biogas, alcohol, and plant oils and their esters.