Faculty of Engineering & Technology
P.K.University
Shivpuri (MP)

Evaluation Scheme & Syllabus for
Department Of Civil Engineering

M. Tech.-(Soil & Water Conservation Engineering)
(I to IV Semester)

(Effective from session 2019-20)

EVALUATION SCHEME

M. Tech -Soil & Water Conservation Engineering
Semester-I

SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
MTSW-101	Advanced Engineering Mathematics	30	70	NA	NA	100
MTSW-102	Land Reclamation	30	70	NA	NA	100
MTSW-103	Soil –Water Plant relationship	30	70	25	25	150
MTSW-104	Soil Salinity and Water Quality	30	70	NA	NA	100
MTSW-105	Research Institution/Industrial visit	NA	NA	25	25	50
MT-ID-106	Seminar-I	NA	NA	25	25	50

Semester-II

SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
MTSW-201	Computer Programming	30	70	25	25	150
MTSW-202	Applied Hydrology	30	70	NA	NA	100
MTSW-203	Drainage of Agricultural Land	30	70	NA	NA	100
MTSW-204	Air Photo Interpretation &Remote Seng.	30	70	25	25	150
MTSW-205	Agricultural Meteorology	30	70	NA	NA	100

Semester-III

SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
MTSW-301	Dissertation phase-I	NA	NA	200	300	600
MTSW-302	Seminar-II	NA	NA	50	50	50

Semester-IV

SUBJECT CODE	SUBJECT NAME	THEORY		PRACTICAL		TOTAL
		SESS.(30)	EXT.(70)	SESS.(25)	EXT.(25)	
MTSW-401	Dissertation phase-I	NA	NA	300	300	600

MT-SW-101-Advanced Engineering Mathematics

(3-1-0)

Gamma, Beta and Legendre's functions, Euler's equations, Lang-range equations, the Ritz method, the Greens functions. Bolazane Weire-strass 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.

Books-

1. Michael Greenberg : Advanced Engineering Mathematics by persons publication.
2. B V Ramana: Higher Engineering Mathematics by core engg.
3. R K JAIN :advanced engineering mathematics book
4. C.B. Gupta S.R. Singh :Engineering Mathematics for Semester I and II by MC Graw – Hill. publication.

MT-SW-102 Land Reclamation

2(2-0-0)

Causes of Land degradation; salinity and sodicity; extent of water logging and salinity problem in India and U.P.;

De-salinization and de-sodification; Reclamation and management of saline soils; Leaching method and period; Salt Balance; Salinity control and Leaching requirements;

Estimating Leaching requirements; Reclamation and management of sodic soils; Reclamation of water logged and salt affected soil through drainage systems; Afforestation of salt affected soils; Selection, operation and maintenance of Land Reclamation machinery;

Economic and social aspects of Land Reclamation.

Books-
1. **A.M. Michael, T.P. Ojha :Principles Of Agricultural Engineering Vol.-1 by jain brother publication.**

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I Year I Semester

MT-SW-103Soil-Water-Plant Relationship

3(2-0-1)

Soil water retention; Infiltration and water uptake; Measurement of soil water content; concept and measurement of soil water potential, Metric potential and Solute potential; Water exchange in plant cells and tissues;

Water movement through the plant systems; Concept and measurement of transpiration and Evapotranspiration;

Energy and water balance; Factors affecting plant-water status, Metabolic and other characteristics for efficient water use; Availability of soil water for plant growth;

Response of plant to water deficit; Effect of salinity on internal water deficit and plant growth.

Practical's –
1. To study and testing of Soil Physical Characteristics
2. To study and testing of Soil moisture
3. To study and testing of Evaporation,
4. To study and testing of Transpiration,
5. To study and testing of Evapotranspiration and plant water status.

MTSW-104– Soil Salinity and Water Quality

2(2-0-0)

Scope and significance of salinity and sodi-city : Source and accumulation of soluble salts; Extent and distribution of salt affected soils.

Salinity and sodicity management; Soil salinity profiles; Plant response to salinity; Salt tolerance evaluation' Leaching and salinity control; Leaching requirement and methods.

Composition of irrigation water; Suitability of water for irrigation;

Salinity management techniques through irrigation; Waste water treatment and re-use for irrigation; Salt and water balance models.

Guidelines for inter-predation of water quality for irrigation.

MTSW-105 Research Institution / Industrial Visit 1 (0-0-1)

Based on Teaching and industrial Visit.

MT SW -201Computer 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

Books:-

1.Hopcroft & Ullman, "Introduction to Automata Theory, Languages, and Computation", Narosa Publishing House.

2.Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Addison Wesley.

3.Dhamdhere, Öperating Systems", Tata McGraw Hill.

4.Aho, Ullman and Sethi, "Compiler Design", Addison Wesley.

MT SW -202- Applied Hydrology

2(2-0-0)

Basic hydrometeorology: Hydrologic cycle; Intensity-duration-frequency analysis of rainfall data.

Interpretation of precipitation data: Stream flow measurement; stage discharge relation; Interpretation of stream flow data; Run-off components and computations.

Hydrograph analysis; Characteristics, separation for simple and complex storms; unit hydrograph theory and its application; derivation of unit hydrograph, Shydro-graph and instantaneous hydrograph.

Flood estimation and routing; Stochastic process in hydrology; Hydrologic design of Engineering structures.

Books-

1. Dilip Kumar Majumdar Irrigations: Water Management: Principles And Practice By, PHI Publication.

2. MR Goyal:Micro Irrigation Management: Technological Advances and Their Applications by, CRC press.

3. Garg S. K. :Water Resources Engineering (Vol. I) by Khanna Publishers

4. Ven Chow , David Maidment :Applied Hydrology by Mcr-hill publication.

MT-SW-203– Drainage of Agricultural Land

3(3-0-0)

Nature and extent of Drainage Problems; drainage Investigation; Hydraulic conductivity measurement in-situ;
Definition and calculation of drainage design criteria under rain fed and irrigated conditions;

Steady and transient – state drainage equations; Design, alignment, construction and maintenance of surface and subsurface drainage systems;

Design, construction and maintenance of mole drains; Guideline for the selection of envelope materials for subsurface drain; Design, construction and maintenance of well drains.
Drainage machineries.**.**

Books-

    1. Irrigations Water Management: Principles And Practice By Dilip Kumar Majumdar , PHI Publication.
    2. Micro Irrigation Management: Technological Advances and Their Applications by MR Goyal, CRC press.

MT-SW-204Air Photo Interpretation and Remote Sensing

3(2-0-1)

Types of Arial photography and factors affecting its quality; Instruments, equipment and material needed for arial photography and its interpretation;

Techniques for interpretation of arial photography.

Basic principles of remote sensing and its application in agriculture and land management; It's use in agricultural and water resource assessment and watershed management; Factor's affecting quality of remote sensing;

Imaginaries and techniques and material needed for its interpretations.

Practical's - Analysis and interpretation of remote sensing data; Educational tour.

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I Year II Semester

MTSW-205Agricultural Meteorology

3(3-0-0)

Definition and Scope; solar radiation; Radiation balance; crop response to solar radiation; Soil heat flux and soil temperature; air temperature and sensible heat flux.

Heat transport and temperature profile in plant canopies; Wind and turbulent transport; crop response to humidity;
Transport of water vapour from evaporating surfaces to air; Effect of microclimate on evaporation and evapotranspiration; Micrometeorological methods for estimating evapotranspiration.

Advection; Photosynthesis; Environmental factors controlling photosynthesis, Light- energy conversion and photosynthesis efficiency, photosynthesis and water use efficiency, Field measurement of photosynthesis; Carbon-dioxide balance; Frost and Frost control; Methods for improving water use efficiency;

Instrumentation in Agricultural Meteorology.