

DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY

Department of Water & Land Management

SYLLABUS for Ph. D. ENTRANCE TEST [PET]

UNIT 1	RESEARCH METHODOLOGY
	Introduction: Meaning of Research, Types of Research, Research & scientific methods with references to water & Land Management & Agricultural & Marketing, Defining the research problems, Identification of Research problems, Technique involved in defining the problems, Research design: Meaning and need of research design, features of a good design, important concepts relating to research design, Sampling designing, Census and sample survey, steps in sample design, Different types of sample designs, Testing of hypothesis, Collection of data, classification of data, measure of central tendency, measure of dispersion; Sampling techniques, Data analysis, Co-relation, regression, Curve fitting, probability; Classical optimization techniques and models, sensitivity analysis; Data sources.
UNIT 2	NATURAL RESOURCES DEVELOPMENT AND UTILIZATION
	Agro climatic zones of India and Maharashtra, Water wealth availability- surface and ground water, Variability of natural resources, Soil & Land occurrence, drought prone areas. Land smoothening, Land Grading & Land Leveling, Kautilian management of Community Water Development & Utilization, Approach of Environment Management, Chak Planning, Field Channel & Structures on it, Types of dams & their components, Compass Traversing, Leveling, Plain table surveying, Remote sensing: Introduction, applications in water and land management and color code, Indian satellite data. Hydrological cycle, Rainfall, runoff, yield computations, Units of water measurement, Hydrology of intercepted catchments, different types of catchments, water availability indices, water harvesting and storage, water storage planning, Infiltration, Water harvesting, evaporation losses from water bodies and surfaces.

UNIT 3	WATER RESOURCES ENGINEERING AND MANAGEMENT
	Water Budgeting in watershed, soil and water conservation methods, Land capability classification, Agro forestry, Social Forestry and other agro – based development

	activities, Sustainability of watershed development programme, Drought management, Project Proposal Preparation, Geology of Maharashtra, Hydrogeology, Aquifers, groundwater survey techniques, Conjunctive use of surface and groundwater, Hydraulics of well, well yield estimation, artificial recharge to groundwater, Economics of groundwater use, Tube wells and their types.
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UNIT 4	IRRIGATION WATER MANAGEMENT
	<p>Soil & its formation, Physical & Chemical characteristics of soil, soils of Maharashtra, Problematic Soils, Soil testing and fertility, Agro. Meteorology, Evapotranspiration and its computation, Soil moisture constants, Crop water requirements, irrigation scheduling, crop water use efficiency, Drip Irrigation: Introduction, Advantages, Disadvantages, Types, components, planning and design; Sprinkler Irrigation: Introduction, Types, Merits & Demerits, and planning & Design; Greenhouse Technology, Govt. Policies & incentives to promote Advance techniques in irrigation, cropping pattern, farming systems, Agro. Technology, Irrigation water management of important agronomical crops, optimization of crop production, Sustainable crop production and Organic farming, Land development and land forming for irrigation, Farm Machinery.</p> <p>Purpose of water use: domestic, cultural, industrial, for animals, sanitation, forest needs; Per capita consumption, Demand and supply, Management of drinking water; Water & health: Water quality assessment, Methods of purification & maintenance; Recycling & reusing of waste water – Municipal, Industrial, Roof -Top rainwater Harvesting</p>

UNIT 5	NATURAL RESOURCES MANAGEMENT
	<p>Managing people & Organizations, Communication technology & interpersonal processes, Leadership, Group Dynamics and teams, Interactive conflict & negotiation Skills; Concepts, Nature, Process and significance of Management. Types of Management, Organization & their functioning; Planning organizing coordination, supervision, motivation, leadership & control with respect to farm – management; Role of Farmer – as a Manager and entrepreneur, applications of modern management techniques to improve decision making process, Agriculture Marketing; Nature and significance of optimization techniques, Linear programming, concepts & assumptions; CPM & PERT; Inventory Models, Sensitivity analysis; Agricultural</p>

	financing, Role of Central and State governments in Agricultural finance, International Financing agencies: IMF, World Bank, UNESCO, Basic Principles of accounting in agriculture, Management of Income flow & Expenditure, Productivity of water, productivity of land under different patterns of use; Agricultural Entrepreneurship, Trade concerns in Indian Agricultural due to WTO and GATT, Role of Agricultural Produce Market Committees [APMC] and APEDA in marketing Agricultural, Entrepreneurship: - setting of Business Unit, Management of resources, financial aspects, legal aspects, MAIDC, MIDC, project report and procedural aspects for setting up small scale Agro based industries.
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Dr. Nitin P. Patil
Chairman

Dr. Ashok S. Kadale
Member

Dr. Ramesh M. Pandav
Member