

## 7CE6.3A: RURAL WATER SUPPLY AND SANITATION

Unit No.	Lecture No.	Contents	Contact Hours
I	1	<b>General:</b> Importance of village community in India	8
	2	Condition of Indian villages with special regard to economical aspects	
	3	Condition of Indian villages with special regard to social aspects	
	4	Condition of Indian villages with special regard to health aspects	
	5	<b>Sources of water:</b> Traditional sources of water in rural areas. Different types of wells	
	6	Sanitary aspects in well construction, pumps used for village wells	
	7	Hand pump Technology, its operation and maintenance	
	8	Water harvesting techniques	
II	9	<b>Quality of water:</b> Estimation of total water requirement including cattle water demand	8
	10	quality of water needed for village community	
	11	water quality surveillance	
	12	standards of water quality	
	13	<b>Communicable Diseases:</b> Diseases and immunity	
	14	Source of communicable diseases	
	15	Mode of transfer, Control of communicable diseases	
	16	Guinea worm Eradication	
III	17	<b>Water Treatment:</b> Slow sand filter	8
	18	Slow sand filter, horizontal roughing filter and their combination	
	19	Disinfection of rural water sources	
	20	Fluoride and its removal	
	21	<b>Schemes of Rural water supply:</b> Different Schemes of Rural water supply in Rajasthan	
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	23	Design and project formulation including the programmes and standards laid by Govt. of India and Govt. of Rajasthan.	
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	25	<b>Milk and Food sanitation</b>	
	26	Essentials of dairy farm and cattle shed sanitation	

IV	27	Tests for milk and dairy products	8
	28	food epidemics, food poisoning, Botulism	
	29	food poisoning, Botulism	
	30	<b>Fly and Mosquito control</b>	
	31	Life cycle of flies and mosquitoes	
	32	various methods of flies and mosquito control	
V	33	<b>Rural Sanitation:</b> Village latrines, VIP latrines, pour flush latrines	10
	34	materials, construction and cost of the latrines	
	35	Pollution aspects and pollution travel from latrines	
	36	Storm water and sludge problems	
	37	Septic tank, soak pit	
	38	small bore sewer system; its design and construction	
	39	Animal waste, method of composting	
	40	Biogas, collection and disposal of waste	
	41	<b>Community Awareness and user participation</b>	
	42	Planning of communication support in rural supply and sanitation projects	
<b>Total</b>			42

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## 1MEV2: ENVIRONMENTAL CHEMISTRY & MICROBIOLOGY

Unit No.	Lecture No.	Contents	Contact Hours
I	1	Microbiology : General Introduction	8
	2	Morphology and classification of bacteria	
	3	Morphology and classification of algae	
	4	Morphology and classification of fungi	
	5	Morphology and classification of viruses	
	6	elements of microscopy	
	7	Light microscopy: sketch, principle, techniques	
	8	Electron microscopy: sketch, principle, techniques	
II	9	Microorganisms of various aerobic and anaerobic biological waste	8
	10	Aerobic and anaerobic treatment processes	
	11	culture media for microorganisms, sterilization	
	12	Culture of microorganisms in batch and continuous reactors	
	13	energy and kinetics of microbial growth	
	14	metabolism and biological fate of pollutants	
	15	Microbiology of water	
	16	Microbiology of soil	
III	17	Microbiology of air	8
	18	Water and air borne diseases and their causative organisms	
	19	Concept of indicator organisms	
	20	Tests for coliforms and streptococci and their significance	
	21	MPN and MF techniques	
	22	MPN and MF techniques, bacteriological standards	
	23	Physical Chemistry : Thermodynamics	
	24	Free Energy, osmosis, dialysis	
IV	25	law of mass action, chemical equilibria	6
	26	basic concepts of chemical kinetics	
	27	Biochemistry of carbohydrates	
	28	Biochemistry of proteins	
	29	Biochemistry of fats and oils	
	30	Enzymes, buffers, EMP nad TCA pathways	
V	31	electron transport mechanism and oxidation	6
	32	phosphorylation, photosynthesis	
	33	Henry's law, activity coefficients	
	34	ionization of weak bases and acids, solubility product	
	35	common ion effect, ways of shifting chemical equilibria	
	36	Adsorption isotherms	
<b>Total</b>			<b>36</b>

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## CE 101: ENVIRONMENTAL ENGINEERING

Unit No.	Lecture No.	Contents	Contact Hours
I	1	<b>Basics of Environment:</b> Environmental Pollution	8
	2	Environmental Acts and Regulations	
	3	Functional concepts of Ecology, Basics of species, Ecosystem	
	4	Hydrological and chemical cycles	
	5	Hydrological and chemical cycles	
	6	Hydrological and chemical cycles	
	7	Energy flow in ecosystems. Biodiversity	
	8	population dynamics	
II	9	<b>Water Pollution:</b> Water pollutants	8
	10	effects of oxygen demand, water quality in lakes, reservoirs & GW	
	11	contaminant transport, self cleaning capacity of streams, waterbodies	
	12	water quality standards	
	13	Waste water management	
	14	Treatment & disposal of wastewater	
	15	Reuse and saving in use of water	
	16	Rain water harvesting	
III	17	<b>Solid Waste Management:</b> Classification of solid waste	8
	18	Collection, transportation, treatment, and disposal of solid waste	
	19	Economic recovery of solid waste	
	20	Sanitary landfill, on site sanitation	
	21	Energy interaction from solid waste	
	22	<b>Air Pollution:</b> Primary and Secondary air pollutants	
	23	Air Pollution, Harmful effects of Air Pollution	
	24	Control of Air Pollution. Noise Pollution	
IV	25	Harmful effects of noise pollution	6
	26	control of noise pollution, Global warming	
	27	Acid rain, Ozone depletion, Green House effect	
	28	<b>Disaster Management:</b> Understanding Disasters	
	29	Hazards and related issues social and environmental	
	30	Risk and Vulnerability, Types of Disasters, their occurrences	
V	31	technical terminology involved, impact and preventive measures	10
	32	<b>Natural Disasters:</b> Hydro-meteorological Based Disasters	
	33	Flood, Flash Flood, Cloud Burst, Drought, Cyclone, Forest Fires	
	34	Geological Based Disasters: Earthquake, Tsunami, Landslides,	
	35	Disaster Management Cycle and its components	
	36	<b>Manmade Disasters:</b> Chemical Industrial Hazards	
	37	Major Power Break Downs, Traffic Accidents	
	38	Disaster profile of Indian continent	
	39	Study of recent major disasters	
	40	Disaster Management Cycle and its components	
<b>Total</b>			40

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