

Aquaculture Engineering - 3(2 +1)

Lecture plane

S. No.	Contents	Lecture Required
1	Fish Farms – Definition, objectives, types of farms, Fresh water, brackish water and marine farms.	1
2	Selection of site for aqua farms- site selection criteria, pre-investment survey viz., accessibility, physical features of the ground, detailed survey viz., site condition, topography, soil characteristics.	1
3	Land surveying – definition, principles of surveying, instruments used for chaining, chaining on uneven or sloping ground and error due the incorrect chain length.	1
4	Chain surveying – definitions, instruments used setting out right angles, basic problems in chaining, cross staff survey.	1
5	Compass surveying- definitions, bearing, meridians, whole circle bearing system, reduced bearing system, theory of magnetic compass, prismatic compass.	2
6	Leveling – definitions, methods of leveling, leveling instruments, terms and abbreviations, types of spirit leveling.	2
7	Plane table surveying – instruments required, working operation, methods.	1
8	Contour surveying – definitions, contour interval, characteristics of contour, contouring methods and uses of contour.	1
9	Calculation of area of regular and irregular plane surfaces, Trapezoidal and Simpson's rule.	1
10	Volume of regular and irregular shape as applied to stacks and heaps, calculation of volume of pond.	1
11	Earth work calculations – excavation, embankment, longitudinal slope and cross slope, calculation of volume of earth work as applied to roads and channels.	1
12	Soil and its properties – classification of soil, soil sampling methods, three phase system of soil, and definitions of soil properties and permeability of soil.	2
13	Pond – classification of ponds, excavated ponds, embankment ponds, barrage and diversion ponds, rosary system and parallel system.	1
14	Planning of fish ponds, layout planning, material planning, manual planning, and comparison of square and rectangular pond, large and small ponds.	1
15	Types of ponds, nursing ponds, rearing ponds and stocking ponds.	1
16	Design of ponds, pond geometry, shape, size, bottom slope of pond etc...	1
17	Constructing ponds viz.. Marking, excavation etc... Dykes peripheral dykes, design of dykes, and construction of dykes.	1
18	Water distribution system – canal, types of canal: feeder canal, diversion canal etc. pipe line system.	1
19	Water control structure – types of inlet and out let and their construction. Water budget equation.	1
20	Pond drainage system seepage and the methods used for seepage control.	1
21	Evaporation and factors affecting evaporation, erosion of soil in dykes and its control.	1
22	Site selection, planning and construction of costal aqua farms. Brackish water Fish Farms – tide fed, Pump fed farms, topography, tidal amplitude, and soil & water sources.	1
23	Hatcheries – site selection, infrastructural facilities, Water supply system main hatchery complex viz.. Layout plan and design of hatcheries – brood stock ponds, Artemia hatching tanks, sheds etc.	2
24	Raceways culture system – site selection, layout plan, types of raceways culture system viz. Parallel system and Series system etc.	1
25	Aerators – Principle, Classification and placement of Aerators.	1
26	Pumps – Purpose of Pumping, Types, Selection of pump, total head and horse power calculation.	1
27	Filters – Types and construction	1
28	Artificial intelligence and smart Aquaculture.	1
Total Theory Classes		32

PRACTICALS

Chapter No.	Practical No.	Name of Practical	Practical Classes Required
I	Chain Surveying		
	Practical No - 1	Study about different equipment used in chain surveying.	1
	Practical No - 2	Study about Ranging its types and its Code Signals. & Obstacle to chaining and ranging.	1
	Practical No - 3	To mark the boundaries of field, identify survey station, lines and determine its area using chain.	1
II	Compass Surveying		
	Practical No - 4	To study about compass surveying instruments and its different adjustments & determine the distance between the two inaccessible points by using a compass.	1
III	Levelling		
	Practical No - 5	Study about different leveling instruments.	1
	Practical No - 6	To find out the difference of elevation between water sources and pond site and to draw the profile of the ground by levelling.	1
IV	Plane Table Surveying		
	Practical No - 7	Study about plane table surveying Equipment's and to plot the position of given field points by radiation method	1
V	Contouring		
	Practical No - 8	To draw the contour for given elevation by direct & Indirect method.	1
VI	Site Evaluation		
	Practical No -9	Evaluation of potential site for aquaculture.	1
VI	Design and Earthwork Calculation		
	Practical No – 10	To design and calculate the volume of earthwork in dykes and excavated pond	1
	Practical No - 11	To Design and calculate the volume of earthwork in channels.	1
VII	Soil Analysis		
	Practical – 12	To study soil sampling methods and determine its texture.	1
VIII	Design and Layout of Aqua farms		
	Practical - 13	To study about design and layout of fresh water farm and Brackish water farms	1
IX	Hatchery		
	Practical - 14	To study about the design and layout of carp hatchery and shrimp hatchery	1
X	Water Requirement Calculation		
	Practical- 15	To calculate total water requirement of an aquafarm.	1
XI	Aquaculture farm visit.		
	Practical- 16	To visit different aquafarms	1
Total Practical			16


Er. Vivek Kumar
Course Instructor