

B.Tech Civil Engineering (AKU Syllabus) SEMESTER- VII

DESIGN OF CONCRETE STRUCTURES – II Credit : 5

1. Design of RCC water tanks, solos, bunkers and simple bridges. Lecture : 14
2. Design of residential buildings. Lecture : 14
3. Design of arches and shells. Lecture : 14

DESIGNS OF HYDRAULIC STRUCTURES Credit : 5

1. **DESIGN & MAINTENANCE OF CANALS:** Design of canal based on tractive force approach, Maintenance of unlined channels (Based on IS 4839 – 1979 part – I), Maintenance of lined channels (Based on IS 4339 – 1979 part – II). Lec : 5
2. **DESIGN OF CANAL OUTLETS.** Lecture : 3
3. **CANAL HEADWORKS**
 - Selection of site for storage & diversion head works
 - Weir or Barrages
 - Divide wall, Scouring sluice or under sluices, fish ladder. Lecture : 5
4. **DAMS**
 - Gravity dams, earth & rock fill dams, buttress dams & arch dams.
 - Spillways & outlet works Lecture : 10
5. **CANAL REGULATION WORKS**
 - Head Regulator, Distributary head regulator, Cross regulators
 - Necessity of channel falls, types of falls & design of vertical drop fall/Sharda type falls Lecture : 10
6. **CROSS – DRAINAGE WORKS**
 - Types of C – D works: Aqueducts, siphon Aqueducts, Super passages, Siphon Super passages, level crossings, Inlet & Outlet.
 - Fluming of channels & design of channel transitions. Lecture : 5
7. An introduction to river basis development. Lecture : 4

Elective-I

ENVIRONMENTAL ENGINEERING – II Credit : 3

1. Generation and collection of waste-water, sanitary, storm and combined sewerage systems, Quantities of sanitary wastes and storm water, Design of sewerage system. Lecture : 7
2. Physical, Chemical and Biological characteristics of waste-water, Primary, Secondary and Tertiary treatment of waste-water. Wastewater; Wastewater Disposal Standards Lec : 4
3. Basic of microbiology Biological : Wastewater treatment systems : BDO, Kinetics, Kinetics and Design of Aerobic Processes- Activated sludge process and its modifications. Trickling filter, RBC, Oxidation ponds and Aerated Lagoons. Lecture : 10
4. Anaerobic process : conventional anaerobic digester, High rate and Hybrid anaerobic reactors, Sludge digestion and handling, Septic tanks, Disposal of effluent and sludge. Lecture: 9

5. Simple design problems on sewerage, waste-water treatment unit and sludge digestion. Lecture : 4

6. Introduction to Municipal solid Waste Management's Lecture : 4

FOUNDATION ENGINEERING Credit : 3

1. Explorations, Geographical Investigation, Characterization of ground, site investigations, method of drilling, sampling. Lecture : 4

2. Bearing Capacity, general, local and punching shear failures, correction for size, shape, depth, water table, eccentricity, ultimate and allowable Bearing capacities, Effect of ground water level. Lecture: 05

3. In-situ tests : SPT, CPT, plates load tests, methods for ultimate bearing capacity based on in situ tests. Lecture: 03

4. Settlement of foundations: Lecture: 03

5. Pile foundation : Introduction, Pile classification, Pile installation, cast in sine pile, Driven pile, load carrying capacity of pile by static and dynamic methods, Pile load test, Pile groups, laterally loaded piles. Lecture: 08

6. Caisson and Well Foundation:- Types of Caisson, Components of Well foundation, Stability analysis of well foundation, Tilt. and Shift. Lecture: 05

7. Expansive Soils : Identification, swelling pressure, Foundation on expansive soil, Stabilization of expansive soils. Lecture: 05

8. Bridge foundations caissons, coffer dams. Excavation and dewatering for foundation. Failures and strengthening, Foundations on weak soils, reclaimed areas, swelling soils and foundations on expansive soils, arching in soil. Lec: 5

9. Machine foundations : Types, Basic definitions. Degree of Freedom of a Block foundation, General criteria for design of machine foundation, 'Free and forced Vibrations and machine foundations subjected in impact loads. Lecture : 9

TRANSPORTATION ENGINEERING – II Credit : 3

1. Railway Engineering :Role of railway in transportation system, railway and highways, comparisons. Lecture: 4

2. Permanent ways : Alignment and grade, cross section and its elements, gauges, grade compensation and widening of gauges on curves, coning of wheels and traction resistance. Lecture : 10

3. Single and Interlocking, Points and crossing, station and yards. Lecture : 10

4. Introduction to Bridge Engineering:

4.1 Introduction, type of bridge and culvert and their suitability, site selection.

4.2 Determination of scour depth, depth of foundation, linear waterway Economic span, Afflux, Freeboard, clearance.

4.3 Load forces and stresses in bridge structures, IRC loading.

4.4 Type of bridge : Super structures flooring and their choice, Details of bearings and joints in Bridge super structure.

4.5 Type of bridge foundation – spread, raft, well and caissons, sinking of well foundations (design excluded, Method of erection of bridges. Lecture 10

5. Introduction to Airports. Lecture : 08