

**SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**

**CIVIL ENGINEERING DEPARTMENT**

**6<sup>TH</sup> SEMESTER**

**Subject:** Advanced Construction & Equipments

**Subject Code:** 2160601

**MID SEM-II: SYLLABUS**

**Module-II:**

**Diaphragm wall construction**

Introduction, uses, site selection criteria

**Coffer Dams:**

Definition, uses, selection of coffer dams, types of coffer dams, design features of coffer dams, leakage prevention, economic height

**Control of Ground water in Excavations:**

Methods-pumping, well points, bore wells, electro-osmosis, injections with cement, clays and chemical, freezing process, vibro- flotation.

**Module-III:**

**Formwork:** Form work for R.C.C. Wall, slab, beam and column, centering for arches of large spans and dams, design features for temporary works, slip formwork, False work for Bridges.

**Module-V:**

**Excavating equipments:**

1. Selection, basic parts, operation, factors affecting output
2. Tractors and related equipment: Bulldozers, Rippers, Scrapers
3. Excavating Equipment: Power shovels, Draglines, Hoes, Clam shells and trenching machines

**Module-VI:**

**Hauling and conveying equipments:**

1. Belt conveyor system: Terminology, Classification, Components, Power requirement estimation and design.
2. Hauling and lifting equipment: Trucks, wagons, cranes etc.
3. Pile boring / driving equipment
4. Concrete Batching plant
5. Tunnel Boring machines
6. Crushers
7. Air compressors
8. Drilling and blasting equipments

Asst. Prof.  
Mrunalini H. Rana  
**Subject Co-ordinator**

Asst. Prof. Aakash B. Desai  
**Subject Partner**

Asst. Prof. Ninaad S. Athalye  
Asst. Prof. Mrunalini H. Rana  
**H.O.D Civil Engg. Dept.**

# SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY

## CIVIL ENGINEERING DEPARTMENT

### 6TH SEMESTER

SUBJECT: APPLIED FLUID MECHANICS

SUBJECT CODE: 2160602

### MID SEM- II : SYLLABUS

#### **Module III**

Open Channel Flow: Basic concept of open channel flow- Steady uniform flow-Velocity distribution-Optimum shape of cross section for uniform flow- Energy equation-specific energy specific energy diagram- discharge diagram-Application of specific energy and discharge diagrams. Non-Uniform steady flow-equations for gradually varied flow- Direct Step method, Rapidly varied flow- Hydraulic jump- Location of hydraulic jump- flow under sluices-Water surface profiles.

#### **Module IV**

Turbo Machinery:Water Turbines: Impulse turbine-Reaction turbine-Specific speed-Unit quantities, Performance characteristics for water turbines

#### **Module V**

Dimensional Analysis and Similitude: Fundamental dimensions- Physical Quantity and Dimensions-Dimensional Homogeneity- Non Dimensional parameters,  $\pi$ -Theorem dimensional analysis, Choice of variables, Determination of Dimensionless parameters. Model Similitude- Physical models- geometric-kinematic and dynamic similarity, Model studies.

**SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**CIVIL ENGINEERING DEPARTMENT**  
**6 TH SEMESTER**

SUBJECT: RAILWAY, BRIDGE AND TUNNEL ENGINEERING

SUBJECT CODE: 2160603

**1 UNIT-III - RAILWAY ENGINEERING**

Railway traction and track resistance, stresses in railway track - rails, sleepers, ballast. Points and crossings - turnouts, switches, crossings. Track junctions - types, splits, diamond, gauntlet, scissor crossovers. Railway stations - requirements, facilities, classifications, platforms, loops, sidings. Railway yards - types, required equipments in yards. Signalling and control system - objectives, classification, Interlocking of signals and points.

**2 UNIT-IV - RAILWAY ENGINEERING**

Railway track - construction, drainage, maintenance. Recent developments in railways - high speed trains, modernization in track for high speed, Metro rails, Monorail, automation in operation and control. Safety in railways - accidents and remedial measures.

**3 UNIT-V - BRIDGE ENGINEERING**

Introduction to bond and development length, Design of shear Bridge hydrology - design discharge, water way, afflux, scour depth, economical span. Bridge components - foundation, piers, abutments, wing wall, approach, bearings, floor, girders, cables, suspenders. Methods of erection of different types of bridges. River training works and maintenance of bridges. Testing and strengthening of bridges. Bridge architect.

**4 UNIT-VI - TUNNEL ENGINEERING**

Tunnels: Necessity/advantage of a tunnel, Classification of Tunnels, Size and shape of a tunnel, Alignment of a Tunnel, Portals and Shafts, Methods of Tunneling in Hard Rock and Soft ground, Mucking, Lighting and Ventilation in tunnel, Dust control, Drainage of tunnels, Safety in tunnel construction.

**SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**CIVIL ENGINEERING DEPARTMENT**  
**6 TH SEMESTER**

SUBJECT: WATER AND WASTEWATER ENGINEERING

SUBJECT CODE: 2160604

**1 Module IV: Distribution system**

Layouts of distribution networks, Components of distribution system, Newton's and Hardy cross methods for network analysis, storage capacity of ESR and underground reservoir, determination of location and height of ESR

**2 Module V: Collection of sewage & estimation of its discharge**

Different types of sewers, sewerage systems, variation in sewage flow, sewer appurtenance, estimation of wastewater discharge in a sewer in sewerage system, estimation of storm water discharge in urban area, separate and combined sewerage systems, laying and testing of sewers

**3 Module VI: Unit operations/ processes for wastewater treatment**

Layout plan and section of municipal wastewater treatment plant, Physical unit operation screening, flow equalization, mixing, flocculation, sedimentation. Chemical unit processes-chemical precipitation. Biological unit processes: Aerobic attached growth and aerobic suspended growth treatment processes, anaerobic suspended growth treatment processes, an aerobic suspended growth treatment processes, low cost sanitation systems, septic tanks, soak pit, stabilization ponds.

**3 Module VII: Design of wastewater treatment units**

Design of racks, screens, grit chamber, aeration units, primary & secondary clarifiers, activated sludge plant and trickling filter units, rotating biological contactors, sludge dewatering units, sludge digesters and drying beds.

**SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**CIVIL ENGINEERING DEPARTMENT**  
**6 TH SEMESTER**

SUBJECT: ELEMENTARY STRUCTURAL DESIGN  
SUBJECT CODE: 2160607

**RCC-**

**1 DOUBLY REINFORCED BEAMS**

Design problems

**2 T BEAM ANALYSIS**

Introduction, Concept & Analysis of T beam

**3 BOND, SHEAR AND DEVELOPMENT LENGTH**

Introduction to bond and development length, Design of shear reinforcement

**4 AXIALLY LOADED COLUMNS**

Introduction, Types, analysis and design of short columns

**5 ONE WAY SLAB**

Introduction, IS code recommendations and design of one way slab

**6 TWO WAY SLAB**

Introduction, IS code recommendations based on types and design of two way slab

**7 ISOLATED COLUMN FOOTING**

Introduction, Concepts of critical sections and design of isolated column footing

**STEEL-**

**1 DESIGN OF TENSION MEMBER**

Introduction and design of tension member

## **DESIGN OF COMPRESSION MEMBER**

2

Introduction and design of compression member

## **DESIGN OF LACING**

Introduction and design of lacing

4

## **DESIGN OF BATTENING**

Introduction and design of battening

5

## **DESIGN OF GUSSET PLATE**

Introduction and design of gusset plate

**SILVER OAK COLLEGE OF ENGINEERING AND TECHNOLOGY**  
**CIVIL ENGINEERING DEPARTMENT**  
**6 TH SEMESTER**

SUBJECT: URBAN TRANSPORTATION ENGINEERING

SUBJECT CODE: 2160608

**1 Module II**

Travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, BRTS and Metro rails, capacity, merits and comparison of systems.

**2 Module IV**

Trip distribution-growth factor models Detroit, furness and fratar methods, gravity model, opportunity models. Modal split analysis-trip end models, trip interchange models, logit models, Trip assignment techniques-route choice, diversion curves, all-or-nothing assignment, capacity restraint models, multiroute assignment technique

**3 Module V**

Mass transit systems: Introduction to routing and scheduling, transit system's performance parameters. Corridor identification and corridor screen line analysis. Urban forms and structures: point, linear, radial, poly-nuclear developments and suitable transit systems, Urban goods movement.