CivilShala (TeXeL Group) Syllabus (Summer Training Program 1)

Theoretical Studies: - (15 Hrs. Lecture+ Practice)

Introduction to structural engineering: Analysis theories and design philosophies, Understanding the response of structural members (beam, column, slab, shear wall, retaining wall, cable, arch, foundation), fundamentals related to various structural system. Analysis of structure by approximate methods (portal and cantilever) Matrix Approach of structure analysis.

Load Calculation: (Dead Load, Live Load, Wind Load, Seismic Load), Study of IS: 875, part I-III, IS: 1893:2002

Introduction to structural dynamics: study of past earthquakes, Design detailing of structural component, study of IS 13920, ductile detailing of RCC structures.

Civil Engineering Materials: Building material, Quality of good buildings (Cement, Sand, Aggregate, Steel, Bricks), Tests on Cement (Field and Laboratory test), Aggregate, Tests on aggregate, Quality of good aggregates, Tests on Concrete, Quality of good concrete, Factors affecting on quality of concrete, Quality of Good Site Engineer, Points keep in mind on Construction Site.

Staad.Pro:- (30 Hrs. Lecture + Practice)

Introduction to CAD Program/Staad.Pro, Structure Geometry & Coordinate System: Model generation, method of creating the model, structure wizard, model editing tools (like add beam, insert node, cut section, add plate view mode etc.), coordinate systems.

Specification and Property: Member property, support specification, material specification, material property, group specification.

Loads and Load Combinations: Type of loads, calculation of live load, dead load, wind load, seismic load according to relevant IS code, how to implement them in structure, generate load combinations.

Analysis: Analysis the structure, viewing the output (shear forces, support reactions, bending moment, stress distribution, animated shape etc.)

Design: General guideline for design, R.C.C. design as per IS 456. (Beams, columns and slabs), steel design as per IS 800

Report Setup and Detailed Engineering Drawing: Viewing the output files of design, print specifications, preparing structural drawings, detailed working drawings.

MS Excel: - (10 Hrs. Lecture+ Practice)

Introduction to MS Excel in civil engineering calculation, Basic and advance programming commands. MS Excel program for concrete mix design as per IS 10262: 2009.

MS Excel program for design of one-way slab and two-way slab, MS Excel program for design of Isolated and combined footing, MS Excel program for counter fort retaining wall.

Guest Lectures: - (5 Hrs. Lectures)

Guest lecture by expert to discuss repair and rehabilitation of existing building.

Guest lecture by expert from construction industry to discuss the role and responsibilities of people in Construction Company, experience sharing.

Execution of construction: - (15 Hrs. Lectures+ Practice)

Construction drawings: (Architectural drawing, Structural drawings, Electrical drawing, plumbing drawings, finished drawings), General arrangement drawing, General notes, line type, Reviewing plan views, elevation views, section views and isometric. Detailing of beam, column, slab, shear wall, retaining wall and foundation.

Pre-Project Activities: Drawing Reading and Detailing, with Site location, Site measurements, Survey of site, Clearance from Government bodies, Architectural planning, Resources of building material, Contract, Types of Contract, Finalization of contractor.

Estimation: Estimation, Purpose of estimation, Method of estimation. Description and units of measurements for common items, Estimation of civil works of a residential building.

Site Visits: - (15 Hrs. (5 sites with site engineer) + Practice)

Site Visit at on-going construction of multi-storey building to understand basics of site execution.

Site Visit at on-going construction of multi-storey building to understand drawing, bar binding schedule, bill of quantity, construction procedure; Quality control: quality control in construction.

Site Visit at on-going construction to understand site conditions; construction equipment; construction materials; challenges for civil engineers; best practices. General aspects: labour management; safety aspect; role and responsibilities of various people at site; description of levelling, alignment, shuttering, formwork, joggling, clear cover, concrete placing.

Site Visit at on-going construction to understand overall process of construction management.

AutoCAD: - (15 Hrs. Lectures + Practice)

Planning in AutoCAD, Drawing Commands in AutoCAD, All Editing Commands in AutoCAD, general arrangement drawing of real life on-going project.

Creating elevations, isometric views using 3D drawing commands, 3D editing commands, structural detailed drawing for RCC and Steel design projects.

Preparing detailed drawings with structural specification for real Life project of consultancy

Projects/Practice/Evaluation: - (15 Hrs. Lectures + Practice)

Design of steel structure project (ongoing or completed real project): Steel Vs Concrete, Comparison of behaviour, Design of steel structure using limit state & working stress method, Design of solar plant steel structure design.

Case Study on tall buildings: Introduction to tall building: frame structures, shear wall structure, bracings, tubular structure, hybrid structure, lateral loads on tall building, Case study on existing tall building

Project 1: Communication tower analysis and design followed by evaluation test1

Project2: Solar Plant analysis and design followed by evaluation test2

Project3: industrial Shed analysis and design followed by evaluation test3

Project report and power point presentation of summer/industrial Training with real life consulting project.

General discussion of opportunities in civil engineering field, feedback session, certificate distribution, presentation and training report evaluation.