



SYLLABUS

ITI Draughtsman Civil Syllabus (Two-Year Course)

1st Semester

Unit 1: Introduction and Orientation

1. **Professional Knowledge (Trade Theory)**
 - **Rules and Regulations of the Institute and Trade**
 - Overview of institute rules and regulations
 - Importance of adherence to rules
 - Trade-specific guidelines and best practices
 - **Institutions & Achievements**
 - Historical background of the trade
 - Significant achievements in the field of civil draughtsmanship
 - Prominent institutions and organizations in civil drafting
2. **Professional Skills (Trade Practical)**
 - **Orientation of Trade and Institution**
 - Tour of the institute and its facilities
 - Introduction to the workshop environment
 - Safety protocols and emergency procedures

Unit 2: Equipment and Standards

1. **Professional Knowledge (Trade Theory)**
 - **List of Equipment**
 - Overview of essential drafting tools and equipment
 - Maintenance and handling of drafting equipment
 - Importance of precision in equipment usage
 - **Introduction to BIS Code of Practice for Architectural and Building Drawings**
 - Understanding BIS standards
 - Application of BIS codes in drafting
 - Importance of adhering to national standards in construction
2. **Professional Skills (Trade Practical)**
 - **Practice with Signs & Symbols in Building Drawings**
 - Familiarization with standard signs and symbols
 - Exercises in using signs and symbols in architectural drawings
 - **Practice with BIS Code of Practice for Building and Architectural Drawings**

- Hands-on practice with BIS guidelines
- Drafting exercises following BIS standards

Unit 3: Building Structures and Materials

1. Professional Knowledge (Trade Theory)

- **Permanent & Temporary Structures**
 - Definition and examples of permanent structures
 - Definition and examples of temporary structures
 - Comparative analysis of permanent and temporary structures
- **Building Materials**
 - Types of building materials (bricks, cement, steel, etc.)
 - Properties and uses of various building materials
 - Selection criteria for building materials
- **Masonry**
 - Types of masonry (brick, stone, concrete)
 - Techniques and tools used in masonry
 - Structural and aesthetic aspects of masonry
- **Treatments for Buildings**
 - Methods of building treatment (damp-proofing, termite-proofing)
 - Importance of building treatments for longevity and safety

2. Professional Skills (Trade Practical)

- **Drawing Details of Various Structures**
 - Detailed drawings of different types of structures
 - Emphasis on accuracy and detail in structural drawings
- **Practice with Various Permanent and Temporary Structures Showing Construction Details**
 - Practical exercises in drafting construction details
 - Comparison of different construction techniques

Unit 4: Foundations, Floors, and Openings

1. Professional Knowledge (Trade Theory)

- **Soil & Foundations**
 - Types of soil and their properties
 - Foundation types (shallow, deep)
 - Factors affecting foundation selection and design
- **Floors & Floorings**
 - Types of flooring materials
 - Techniques of floor construction
 - Maintenance and durability of different types of flooring
- **Reinforced Cement Concrete (RCC)**
 - Basics of RCC
 - Uses and advantages of RCC in construction
 - Techniques of RCC construction
- **Doors, Windows, & Ventilators**
 - Types of doors, windows, and ventilators
 - Materials used for doors and windows
 - Construction and installation techniques

2. Professional Skills (Trade Practical)

- **Drawing Details of Various Floors and Flooring**
 - Practical exercises in drafting floor plans
 - Detailing different types of flooring materials
- **Drawing Details of Various Doors, Windows, and Ventilators**
 - Drafting different types of doors and windows
 - Emphasis on construction details and installation techniques

Unit 5: Arches, Lintels, Roofs, and Stairs

1. Professional Knowledge (Trade Theory)

- **Arches & Lintels**
 - Types of arches and lintels
 - Construction techniques for arches and lintels
 - Structural significance of arches and lintels
- **Roofs**
 - Types of roofs (flat, pitched, curved)
 - Materials and construction techniques for roofs
 - Importance of roof design in building aesthetics and functionality

2. Professional Skills (Trade Practical)

- **Drawing Details of Arches and Lintels**
 - Practical exercises in drafting arches and lintels
 - Emphasis on structural details and construction techniques
- **Drawing Details of Various Roofs**
 - Drafting different types of roofs
 - Practical exercises in roof construction details
- **Drawing Details of Different Types of Stairs**
 - Practical exercises in drafting staircases
 - Emphasis on design, safety, and functionality

Unit 6: Computer Applications in Drafting

1. Professional Knowledge (Trade Theory)

- **Fundamentals of Computers**
 - Basic computer concepts and terminology
 - Introduction to computer hardware and software
 - Overview of operating systems and application software
- **Introduction to CAD**
 - Basics of Computer-Aided Design (CAD)
 - Importance of CAD in modern drafting
 - Introduction to CAD software (AutoCAD, etc.)

2. Professional Skills (Trade Practical)

- **Practice with Operating (Windows) and Application (MS Office) Software**
 - Hands-on exercises with Windows OS
 - Practical use of MS Office applications (Word, Excel, PowerPoint)
- **Project Work**
 - Integration of theory and practical skills in a comprehensive project
 - Application of drafting skills in a real-world scenario

2nd Semester

Unit 7: Planning and Regulations

1. Professional Knowledge (Trade Theory)

- **Building Bye-laws**
 - Overview of local building regulations and codes
 - Importance of compliance with building bye-laws
 - Procedures for obtaining building permits and approvals
- **Planning a Public Building**
 - Principles of planning public buildings
 - Considerations for functionality, accessibility, and aesthetics
 - Case studies of well-planned public buildings
- **Principles of Planning a Residential Building**
 - Basic principles of residential building design
 - Space planning and utilization
 - Importance of ventilation, lighting, and privacy

2. Professional Skills (Trade Practical)

- **Practice Using Rules of Local Building Development**
 - Hands-on exercises in applying local building codes
 - Practical applications of building bye-laws in drafting
- **Planning of Different Types of Buildings**
 - Practical exercises in planning residential and public buildings
 - Emphasis on functionality, aesthetics, and regulatory compliance

Unit 8: Advanced Structural Elements

1. Professional Knowledge (Trade Theory)

- **Reinforced Cement Concrete (RCC)**
 - Advanced concepts in RCC design and construction
 - Techniques for reinforcing and curing RCC structures
 - Applications of RCC in high-rise buildings and large structures
- **Prefabricated Structures**
 - Introduction to prefabricated building techniques
 - Advantages and disadvantages of prefabrication
 - Examples of prefabricated structures
- **Steel Structures**
 - Basics of steel construction
 - Types of steel structures (beams, columns, trusses)
 - Techniques for assembling and welding steel components

2. Professional Skills (Trade Practical)

- **Practice with Prefabricated Structures of Buildings**
 - Practical exercises in drafting prefabricated building components
 - Emphasis on construction details and assembly techniques
- **Drawing Details of Steel Structures**
 - Drafting steel beams, columns, and trusses
 - Practical exercises in steel structure design

Unit 9: Plumbing and Openings

1. Professional Knowledge (Trade Theory)

- **Plumbing**

- Basics of plumbing systems in buildings
 - Types of pipes and fittings
 - Techniques for installing and maintaining plumbing systems
2. **Professional Skills (Trade Practical)**
- **Drawing Details of Different Opening Structures**
 - Practical exercises in drafting plumbing layouts
 - Emphasis on pipe routing and fixture placement

Unit 10: Advanced Computer Applications

1. **Professional Knowledge (Trade Theory)**
- **2D, 3D with CAD, 3D Max, STAAD**
 - Advanced CAD techniques for 2D and 3D drafting
 - Introduction to 3D Max for architectural visualization
 - Basics of STAAD for structural analysis
2. **Professional Skills (Trade Practical)**
- **Drawing Details of Public Building Designs**
 - Practical exercises in drafting public building plans
 - Emphasis on advanced CAD techniques and software integration
 - **Drawing in 2D, 3D in Software**
 - Hands-on practice with 2D and 3D CAD software
 - Project Work

3rd Semester

Unit 11: Water Resources and Transport Infrastructure

1. **Professional Knowledge (Trade Theory)**
- **Water Resources**
 - Overview of water resource management
 - Techniques for designing irrigation systems and water supply networks
 - Case studies of successful water resource projects
 - **Railways**
 - Basics of railway infrastructure design
 - Types of railway tracks and gauges
 - Techniques for laying and maintaining railway tracks
 - **Roads**
 - Principles of road design and construction
 - Types of road surfaces and materials
 - Maintenance and repair of road infrastructure
2. **Professional Skills (Trade Practical)**
- **Drawing Irrigation Structures**
 - Practical exercises in drafting irrigation system layouts
 - Emphasis on design accuracy and functionality
 - **Drawing Details of Rails & Gauges**
 - Drafting railway track layouts and gauges
 - Practical exercises in railway infrastructure design
 - **Drawing Details of Construction of Various Kinds of Roads**
 - Practical exercises in road design and construction details

Unit 12: Public Health Engineering (PHE) and Bridges

1. **Professional Knowledge (Trade Theory)**
 - **Public Health Engineering (PHE)**
 - Overview of public health engineering systems
 - Techniques for designing water supply and drainage systems
 - Importance of hygiene and sanitation in public health engineering
 - **Bridges**
 - Types of bridges (suspension, arch, beam, etc.)
 - Techniques for designing and constructing bridges
 - Case studies of iconic bridge projects
2. **Professional Skills (Trade Practical)**
 - **2D, 3D Drawings of PHE**
 - Practical exercises in drafting PHE systems
 - Emphasis on design accuracy and regulatory compliance
 - **Drawing the Types of Bridges**
 - Drafting different types of bridges
 - Practical exercises in bridge design and construction details

Unit 13: Structural Drawings and Advanced CAD

1. **Professional Knowledge (Trade Theory)**
 - **Structural Drawings**
 - Overview of structural drawing techniques
 - Importance of accuracy and detail in structural drawings
 - Techniques for drafting complex structural elements
2. **Professional Skills (Trade Practical)**
 - **Drawing Building Structures in 2D and 3D**
 - Practical exercises in drafting building structures
 - Emphasis on advanced CAD techniques and software integration
 - **Drawing 2D, 3D CAD Structures of Bridges**
 - Hands-on practice with CAD software for bridge design
 - Project Work

4th Semester

Unit 14: Surveying Techniques

1. **Professional Knowledge (Trade Theory)**
 - **Surveying Classification**
 - Overview of surveying techniques and classifications
 - Importance of surveying in civil engineering
 - Introduction to surveying instruments and tools
 - **Levelling Introduction, Theodolite, and Understanding of the Parts**
 - Basics of levelling in surveying
 - Introduction to theodolite and its components
 - Techniques for accurate levelling and measurement
2. **Professional Skills (Trade Practical)**
 - **Reading Topographic Maps, Contours Drawings**
 - Practical exercises in reading and interpreting topographic maps

- Emphasis on accuracy and detail in contour drawings
- **Field Procedure in Coordinate Measuring Field to Run Traverse Survey-Linking Files**
 - Hands-on practice in field surveying techniques
 - Emphasis on accurate measurement and data recording
- **Operating and Setting up a Theodolite, Observation of Readings, and Sighting Points**
 - Practical exercises in theodolite operation
 - Techniques for accurate observation and measurement

Unit 15: Advanced Surveying and Remote Sensing

1. **Professional Knowledge (Trade Theory)**
 - **Total Station Application, Accessories Used, Features, Electronic Display, Components Parts, Characteristics, and Data Reading**
 - Introduction to Total Station and its components
 - Techniques for using Total Station in surveying
 - Importance of accurate data reading and recording
 - **Remote Sensing Introduction and Its Application in Civil Engineering and the Remote Sensing System**
 - Basics of remote sensing technology
 - Applications of remote sensing in civil engineering
 - Overview of remote sensing systems and techniques
2. **Professional Skills (Trade Practical)**
 - **Project Work**
 - Comprehensive project integrating surveying and remote sensing techniques
 - Application of theoretical knowledge in practical scenarios
 - **GPS – Steps in Mapping, Components, Comparison of GIS with GPS, CAD, and Other Applications**
 - Practical exercises in GPS mapping
 - Comparison of GIS with GPS and CAD applications

Unit 16: Estimation and Sewerage Systems

1. **Professional Knowledge (Trade Theory)**
 - **Estimate Importance, Types**
 - Overview of estimation techniques in civil engineering
 - Importance of accurate estimation for project planning and budgeting
 - Types of estimates (preliminary, detailed, etc.)
2. **Professional Skills (Trade Practical)**
 - **Preparing Estimate Through the Use of Software**
 - Practical exercises in preparing estimates using software
 - Emphasis on accuracy and detail in estimation
 - **Preparing the Drawing System of Sewerage - 1 Pipe System, 2-Pipe System, and Stack System**
 - Practical exercises in drafting sewerage systems
 - Techniques for designing efficient and effective sewerage systems

