

# DEPARTMENT OF CIVIL TECHNOLOGIES

## First Year - Weekly Course Description & Syllabus

### 1. Human Rights & General Freedom

| WEEK    | THEORETICAL TOPICS                                              |
|---------|-----------------------------------------------------------------|
| Week 1  | Concept of Human Rights and Historical Background               |
| Week 2  | Human Rights in Ancient Civilizations and Religions             |
| Week 3  | Human Rights in Modern Times and International Declarations     |
| Week 4  | Universal Declaration of Human Rights (1948)                    |
| Week 5  | International Covenants on Civil and Political Rights           |
| Week 6  | International Covenant on Economic, Social, and Cultural Rights |
| Week 7  | Democracy: Concept, Origins, and Development                    |
| Week 8  | Forms and Types of Democracy                                    |
| Week 9  | Guarantees and Prerequisites for Applying Democracy             |
| Week 10 | Public Rights and Constitutional Freedoms                       |
| Week 11 | Personal Freedoms and Freedom of Opinion/Expression             |
| Week 12 | Right to Education, Work, and Healthcare                        |
| Week 13 | Rule of Law and Separation of Powers                            |
| Week 14 | Electoral Systems and Citizen Participation                     |
| Week 15 | Human Rights Guarantees in National Legislations                |

### 2. Arabic Language

| WEEK    | THEORETICAL TOPICS                                       |
|---------|----------------------------------------------------------|
| Week 1  | Introduction to Arabic Grammar and Sentence Structure    |
| Week 2  | Nouns, Verbs, Particles, and Declinability (I'rab)       |
| Week 3  | The Nominal Sentence: Subject and Predicate              |
| Week 4  | Verbal Sentence: Verbs, Subject, and Objects             |
| Week 5  | Common Orthographic and Spelling Rules                   |
| Week 6  | Hamza Rules (Initial, Medial, and Final)                 |
| Week 7  | Punctuation Marks and Writing Conventions                |
| Week 8  | Common Linguistic and Grammatical Errors                 |
| Week 9  | Methods of Drafting Administrative and Technical Letters |
| Week 10 | Drafting Technical and Administrative Reports            |
| Week 11 | Literary and Technical Text Reading Comprehension        |
| Week 12 | Dictionary Searching Techniques and Lexicography         |
| Week 13 | Numbers and Numerical Grammar Rules                      |
| Week 14 | Summarization and Resume Drafting Skills                 |
| Week 15 | Final Review of Administrative Language Applications     |

### 3. Computer Fundamentals

| WEEK    | THEORETICAL SYLLABUS                   | PRACTICAL / LABORATORY SYLLABUS              |
|---------|----------------------------------------|----------------------------------------------|
| Week 1  | Introduction to Computers & Hardware   | Physical components identification & setup   |
| Week 2  | Software & Operating Systems Overview  | Windows OS basics and file navigation        |
| Week 3  | Number Systems (Binary, Octal, Hex)    | File management and folder organization      |
| Week 4  | Word Processing: MS Word Interface     | Document creation, text formatting, margins  |
| Week 5  | MS Word: Paragraph Formatting & Styles | Paragraph alignment, spacing, bulleting      |
| Week 6  | MS Word: Tables & Graphic Elements     | Table insertion, editing, image formatting   |
| Week 7  | Spreadsheets: MS Excel Interface       | Worksheet setup, cell formatting, entry      |
| Week 8  | MS Excel: Mathematical Formulas        | Basic formulas (SUM, AVERAGE, MIN, MAX)      |
| Week 9  | MS Excel: Logical Functions            | IF statements, conditional formatting        |
| Week 10 | MS Excel: Data Charts & Plots          | Creating bar charts, line graphs, formatting |
| Week 11 | Presentation: MS PowerPoint            | Slide creation, layouts, transitions         |
| Week 12 | Computer Networks & Internet Basics    | Web browsing, search techniques, email       |
| Week 13 | Data Security & Computer Viruses       | Antivirus usage, data backup methods         |
| Week 14 | Cloud Storage & Information Sharing    | Google Drive / OneDrive basic usage          |
| Week 15 | Practical Applications & Review        | Comprehensive practical skills assessment    |

### 4. Mathematics I

| WEEK    | THEORETICAL TOPICS                                           |
|---------|--------------------------------------------------------------|
| Week 1  | Functions, Domain, Range, and Function Graphs                |
| Week 2  | Trigonometric Functions and Fundamental Identities           |
| Week 3  | Limits and Continuity Rules                                  |
| Week 4  | Derivatives: Definition and Differentiation Rules            |
| Week 5  | Derivatives of Trigonometric and Inverse Functions           |
| Week 6  | Exponential and Logarithmic Functions and Derivatives        |
| Week 7  | L'Hôpital's Rule for Indeterminate Limits                    |
| Week 8  | Applications of Derivatives: Tangents and Normals            |
| Week 9  | Applications of Derivatives: Maxima, Minima, Curve Sketching |
| Week 10 | Definite and Indefinite Integration Fundamentals             |
| Week 11 | Integration Techniques: Substitution Method                  |
| Week 12 | Integration Techniques: Integration by Parts                 |
| Week 13 | Integration Techniques: Partial Fractions                    |
| Week 14 | Applications of Definite Integrals: Area Between Curves      |
| Week 15 | Applications of Integrals: Volumes of Solids of Revolution   |

## 5. Engineering Drawing I & II

| WEEK    | THEORETICAL & PRACTICAL TOPICS                                      |
|---------|---------------------------------------------------------------------|
| Week 1  | Introduction to Engineering Drawing, Instruments, and Sheet Layout  |
| Week 2  | Standard Line Types, Lettering, and Dimensioning Techniques         |
| Week 3  | Geometric Construction: Bisecting Lines, Angles, and Polygons       |
| Week 4  | Geometric Construction: Tangents, Arcs, and Ellipse Construction    |
| Week 5  | Orthographic Projection: Principles and Angle Views                 |
| Week 6  | Orthographic Projection: Multi-view Drawings of Simple Models       |
| Week 7  | Orthographic Projection: Complex Models and Missing View Projection |
| Week 8  | Pictorial Projection: Isometric Projection Principles               |
| Week 9  | Isometric Construction of Models with Inclined Surfaces             |
| Week 10 | Isometric Construction involving Circles and Cylindrical Surfaces   |
| Week 11 | Oblique Projection Principles (Cavalier and Cabinet Projection)     |
| Week 12 | Sectional Views: Full Sectioning Concepts and Cutting Planes        |
| Week 13 | Sectional Views: Half Sectioning and Offset Sectioning              |
| Week 14 | Freehand Engineering Sketching Techniques                           |
| Week 15 | Comprehensive Drawing Sheet Applications and Portfolio Assessment   |

## 6. Building Materials

| WEEK    | THEORETICAL SYLLABUS                                | PRACTICAL / LABORATORY SYLLABUS        |
|---------|-----------------------------------------------------|----------------------------------------|
| Week 1  | Introduction to Construction Materials & Properties | Sampling methods & moisture testing    |
| Week 2  | Clay Bricks: Manufacturing & Types                  | Brick dimensions & absorption test     |
| Week 3  | Bricks Testing & Quality Specifications             | Brick compressive strength testing     |
| Week 4  | Concrete Blocks: Production & Properties            | Concrete block strength testing        |
| Week 5  | Gypsum & Plastering Materials                       | Setting time test for gypsum           |
| Week 6  | Lime & Mortars: Types and Properties                | Mortar consistency and strength tests  |
| Week 7  | Cement: Manufacturing & Types                       | Fineness test of Portland cement       |
| Week 8  | Cement Physical Properties & Hydration              | Normal consistency test of cement      |
| Week 9  | Cement Setting Time & Soundness                     | Initial & final setting time test      |
| Week 10 | Aggregates: Classification & Properties             | Sieve analysis test of aggregates      |
| Week 11 | Aggregate Grading & Specific Gravity                | Specific gravity & absorption test     |
| Week 12 | Building Stones: Properties & Classification        | Stone absorption & density test        |
| Week 13 | Timber & Wood Products in Construction              | Wood moisture content determination    |
| Week 14 | Metals & Steel in Construction                      | Tensile strength testing of steel bars |
| Week 15 | Insulating & Waterproofing Materials                | Material absorption and quality check  |

## 7. Surveying I

| WEEK    | THEORETICAL SYLLABUS                              | PRACTICAL FIELDWORK                    |
|---------|---------------------------------------------------|----------------------------------------|
| Week 1  | Introduction to Surveying and Field Measurements  | Surveying tools and tapes handling     |
| Week 2  | Linear Measurements & Distance Taping             | Taping over flat and sloping ground    |
| Week 3  | Tape Surveying Obstacles and Corrections          | Setting perpendiculars using tape      |
| Week 4  | Leveling Principles and Equipment Setup           | Automatic Level setup and reading      |
| Week 5  | Differential Leveling Methods                     | Differential leveling field execution  |
| Week 6  | Height of Instrument (HI) Method                  | HI leveling calculation & booking      |
| Week 7  | Rise and Fall Method                              | Rise & Fall calculation & check        |
| Week 8  | Profile Leveling & Longitudinal Sections          | Profile leveling along center line     |
| Week 9  | Cross-Section Leveling                            | Cross-section field measurements       |
| Week 10 | Contour Surveying Concepts and Features           | Grid method contouring in field        |
| Week 11 | Contour Map Construction and Interpolation        | Plotting contour maps from field data  |
| Week 12 | Earthwork Volume Calculations (Cut & Fill)        | Volume calculation from cross-sections |
| Week 13 | Area Computation Methods (Planimeter, Coordinate) | Area measurement on maps               |
| Week 14 | Compass Surveying & Bearing Systems               | Prismatic compass bearing reading      |
| Week 15 | Field Leveling Exam & Equipment Practice          | Field operational exam                 |

## 8. Descriptive Geometry

| WEEK    | THEORETICAL & DRAWING TOPICS                             |
|---------|----------------------------------------------------------|
| Week 1  | Principles of Projection and Reference Planes            |
| Week 2  | Point Projection in Four Quadrants                       |
| Week 3  | Straight Line Projection and Positions                   |
| Week 4  | True Length and Inclination Angles of a Line             |
| Week 5  | Traces of a Straight Line                                |
| Week 6  | Relative Positions of Two Straight Lines                 |
| Week 7  | Plane Representation and Types of Planes                 |
| Week 8  | Traces of a Plane and Special Positions                  |
| Week 9  | Point and Line lying on a Plane                          |
| Week 10 | Intersection of Planes and Lines with Planes             |
| Week 11 | Parallelism and Perpendicularity of Lines and Planes     |
| Week 12 | Revolutions: Revolving a Line and Plane                  |
| Week 13 | Polyhedron Projection (Prism and Pyramid)                |
| Week 14 | Solids of Revolution Projection (Cylinder and Cone)      |
| Week 15 | Intersection of Surfaces and Geometric Solid Development |