

4-YEAR DIPLOMA IN ENGINEERING PROGRAM

ARCHITECTURE AND INTERIOR DESIGN TECHNOLOGY

**SYLLABUS
(COURSE STRUCTURE-2010)**

**SEVENTH & EIGHTH
SEMESTER**

ARCHITECTURE & INTERIOR DESIGN TECHNOLOGY (87)
SEVENTH SEMESTER

Sl. No	Subject code	Name of the subject	T P C			MARKS				
						Theory		Practical		Total
						Cont. assess	Final exam.	Cont. assess	Final exam.	
1	8771	Interior Design –IV	2	6	4	20	80	50	50	200
2	8772	Furniture Design & Drawing	1	6	3	10	40	50	50	150
3	8773	Construction Documentation and Professional Practices.	2	-	3	20	80	-	-	100
4	6165	Landscape Design	1	3	2	10	40	25	25	100
5	8774	Interior project	0	6	2	0	0	50	50	100
6	6453	Environmental Engineering-1	2	3	3	20	80	25	25	150
7	6463	Design of Structure-I	3	3	4	30	120	25	25	200
8	5853	Entrepreneurship	2	0	2	20	80	-	-	100
Total			14	27	23	140	560	225	225	1100

ARCHITECTURE & INTERIOR DESIGN TECHNOLOGY (87)
EIGHTH SEMESTER

Sl. No	Subject code	Name of the subject	T P C			MARKS				
						Theory		Practical		Total
						Cont. assess	Final exam.	Cont. assess	Final exam.	
1	8781	Industrial Training	0	0	6	-	-	180	120	300
Total					6					300

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SEVENTH SEMESTER

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4-YEAR DIPLOMA IN ENGINEERING PROGRAM

ARCHITECTURE & INTERIOR DESIGN TECHNOLOGY (87)

**SYLLABUS
(COURSE STRUCTURE-2010)**

SEVENTH SEMESTER

8771 INTERIOR DESIGN-IV

T	P	C
2	6	4

AIMS

- To be able to understand the planning of an educational building.
- To be able to prepare a set of drawing of a school building
- To be able to make school building lay out.
- To be able to understand structure of education building .

SHORT DESCRIPTION

Educational Background and School Organization; Structure of Education; Site Design for school; recreation facility Layout; Safety & Security; Function of Economy & Content; Class room Design; Reader Accommodations; Core Location of an Office; Main Stair and Fire Escape; General Principle; service area Layout; Guide for Space Allowance; Drive Way; Stopped Way/Ramp.

DETAIL DESCRIPTION**Theory:**

- 1 Understand the general consideration to design a school building**
 - 1.1 State structure of Education in Asia pacific region.
 - 1.2 Define the following terms – Central and regional school, Community school, Daycare, Elementary school, International school, Junior high school, Kindergarten, Middle school, Neighborhood school, Nursery, Primary, School without walls, Secondary, Senior high, Special & Urban Schools.
- 2 Understand the basic idea to Site selection of a school.**
 - 2.1 Explain the site selection criteria of school.
 - 2.2 State the space allocation & relationships.
 - 2.3 Discuss the circulation of vehicular service with fig. of parking system.
 - 2.4 Describe the recreational facility layout, materials & drainage facility for school.
- 3 Understand the space accommodation for a secondary school building.**
 - 3.1 State the basic concepts of teaching.
 - 3.2 Discuss plan and orientation for function of economy.
 - 3.3 Explain solar controls, space conditioning, lighting and acoustics for function of school building.
 - 3.4 Discuss the class room planning.
 - 3.5 Explain the general requirements for all class rooms such as – electrical and data access, air-conditioning and ventilation, lighting, projection equipment.
 - 3.6 Explain the doors, acoustic and visual control of a class room.
 - 3.7 Discuss the auditorium for a school.
- 4 Understand the furniture list of a school building.**
 - 4.1 Describe general feather for furniture arrangement.
 - 4.2 State data & distribution of furniture size.
 - 4.3 Mention dimensional data on behave of size of pupils & furniture.

4.4 Describe storage of pupils personal belongings.

5 Understand the internal access of the school building.

5.1 Discuss the furniture placement of a school building.

5.2 Discuss the minimum & maximum clear dimension between the furniture

5.3 Mention the clear distance from wall to furniture.

6 Understand the necessity of play ground with in school building.

6.1 Define the age of the pupils of the school.

6.2 Describe the necessity of co-curriculum activities of a school.

6.3 Explain several kinds of ground activities of a school.

6.4 Mention the area & landscape in front of school building.

7 Understand the safety & security of school building.

7.1 Discuss the building lay-out of school for safety and security.

7.2 State landscaping and lighting consideration of school.

7.3 Describe the accessibility provision such as school exits, stair ways, corridors, doors and school entry, toilet facilities with standard data.

8 Necessity of parking area for a school building.

8.1 Describe the factors to determine a drive way and turning radius.

8.2 Describe straight and curve driveway and its formula.

8.3 Describe curved device ways and determine its factors.

8.4 Describe double drive ways, drive way exit.

8.5 Describe the vehicle length & width.

8.6 Discuss the slope of ramp, ramp break over angle, angle of departure and angle of approach.

9 Understand the office space & teachers room of a school building.

9.1 Mention the work flow of a school office area.

9.2 Describe the straight line principle.

9.3 Describe the necessity of internal circulation of an office area.

9.4 Describe space allowances i.e. office space & file space, special equipment, storage space, special room allowances.

10 Understand the service area for a school building.

10.1 Define service system of a school building.

10.2 Describe location of the service component such as staircase, toilet, office area, canteen etc of the school building.

10.3 Describe the factors determine the size & number staircase.

10.4 Describe the services data provided in vertical ducts.

10.5 Describe the factors that determine the size, shape, location and number of lavatories.

10.6 Describe the efficiency of the school building.

11 Understand the lecture rooms & auditorium accommodation of the school building.

11.1 Define auditorium.

11.2 Describe lecture position & direction.

11.3 Explain the audience seating with minimum dimensions of the auditorium.

11.4 Mention the basic shape of the auditorium.

12 Understand the national interest of secondary education system by the government.

12.1 Define secondary education system.

12.2 Describe the number of ongoing high school children in Bangladesh.

12.3 Mention the annual development goal about secondary school education.

12.4 Explain the public interest and participant about school system.

Practical:

1 Prepare the design & drawing of a school.

- 1.1 Draw the flow diagram showing different area used in school.
- 1.2 Sketch the line plan of a school as per given requirements.
- 1.3 Develop the floor plan according to the scale.(1:100)
- 1.4 Draw the front & side elevation according to scale.
- 1.5 Draw a section through the stair and part section through entrance & verandah.
- 1.6 Make a presentation drawing for approval by the client (plan, Elevation, section (scale - 1:100 or $\frac{1}{8}''=1'-0''$).
- 1.7 Draw different elevation with shade & shadow (scale - 1:100 or $\frac{1}{8}'' = 1'-0''$).

2 Prepare the detail plan of class room & teachers' room.

- 2.1 Draw seating arrangement of a classroom with clear dimension.
- 2.2 Draw a wall cabinet for the classroom.
- 2.3 Draw the head master's room with furniture arrangement.
- 2.4 Draw the teachers' room with furniture arrangement.
- 2.5 Draw the common & individual toilet detail plan & section of the school .

3 Prepare the different types of shading device according to orientation.

- 3.1 Draw north-west isometric view with sunshade.
- 3.2 Draw different types of shading device used in school building.

4 Prepare extra purpose of school building.

- 4.1 Draw a plan of an auditorium.
- 4.2 Draw the furniture layout in the auditorium with clear dimension.
- 4.3 Draw a plan of a library for the school with furniture arrangement.
- 4.4 Detail drawing of a bookshelf & a reading table of the library.

5 Site visit, case study & prepare a report for presentation.

- 5.1 Visit any nearest district school.
- 5.2 Take photographs of ancient and modern school building of that district.
- 5.3 Analysis the orientation of the school building and the toilet facilities.
- 5.4 Investigate the present needs of that school.
- 5.5 Present the report with photograph.

6 Prepare the working drawing set of a school building.

- 6.1 Draw all floor plan showing all dimensions (scale 1:50 or $\frac{1}{4}'' = 1'-0''$).
- 6.2 Draw front and any other side elevation (scale 1:50 or $\frac{1}{4}'' = 1'-0''$).
- 6.3 Draw a section through stair (scale 1:50 or $\frac{1}{4}'' = 1'-0''$).
- 6.4 Draw roof plan showing rain water drainage (scale 1:50 or $\frac{1}{4}'' = 1'-0''$).
- 6.5 Make a door-window schedule for the building.

7 Prepare landscape design in the site plan.

- 7.1 Draw the lay-out plan of a school building.
- 7.2 Draw 90° , 60° & 45° car parking in the site plan.
- 7.3 Show the walkway, trees, ground area in the site plan.

- 8 Prepare a set of drawing for office section of a school building.**
- 8.1 Draw the desk clearance for office room.
 - 8.2 Draw the typical modular office plan.
 - 8.3 Draw the corridor width based of the human figure.
 - 8.4 Draw the furniture lay-out for head master office.
- 9 Prepare electrical drawing of a school building.**
- 9.1 Draw the various electrical systems used in school building drawing.
 - 9.2 Draw first and typical floor electrical fixture lay-out plan.
 - 9.3 Show detail electrical circuit diagram.
 - 9.4 Show the conduit lay-out in the plan.

REFERENCE BOOKS

1. School Building Design Asia
UNESCO
2. Ernst Neufert
ARCHITECT'S DATA
by: Vincent Jjones
George Atkinson OBEBA (Arch) RIBA.

AIDT 8772 FURNITURE DESIGN AND DRAWING

T	P	C
1	6	3

AIMS

- To be able to understand the history of the furniture.
- To be able to understand the furniture style.
- To be able to understand the design criteria of furniture's and cabinets.
- To be able to understand the design & development of furniture.
- To be able to understand the rendering process of furniture.
- To be able to understand the molding, fasteners and gluing, clamping.
- To be able to develop knowledge, skill and attitude of preparing different types of house furniture's.

SHORT DESCRIPTION

Historic furniture for interior design; Furniture style; Furniture & cabinets; Design & development of furniture; Process of design work; Rendering of furniture; molding, fasteners and gluing, clamping & fasteners; plywood ; contemporary materials Glass,Cane, Steel,Fiber Glass, Plastic Materials.

DETAIL DESCRIPTION

Theory:

- 1 Understand the historical furniture for interior design.**
 - 1.1 Discuss the importance of historical furniture in interior design.
 - 1.2 Describe the principle periods of English furniture.
 - 1.3 Describe the principle periods of French furniture.
 - 1.4 Describe the principle periods of American furniture.

- 2 Understand the furniture style.**
 - 2.1 List the major three categories furniture which are used for Residential Building.
 - 2.2 Mention the traditional style of furniture.
 - 2.3 Mention the provincial style of furniture.
 - 2.4 Mention the contemporary style of furniture.
 - 2.5 Describe formal and informal furniture styles.
 - 2.6 Describe the queen Anne style of furniture and its characteristics.

- 3 Understand the design criteria of furniture's and cabinets.**
 - 3.1 List the fundamentals of good design of furniture.
 - 3.2 List the elements of design for furniture.
 - 3.3 Mention the principle of design for furniture.
 - 3.4 Discuss the common error in design.
 - 3.5 Mention the steps in designing furniture.

- 4 Understand design & development of furniture.**
 - 4.1 Discuss the development and progress of furniture.
 - 4.2 Describe the scientific and artistic qualities of furniture.

- 4.3 Describe the criteria for the selection of materials.
- 4.4 Describe the economy of furniture.

5 Understand the rendering process of furniture.

- 5.1 Describe the importance of rendering of furniture.
- 5.2 Describe the necessity of modeling of furniture.
- 5.3 State the necessity of detail drawing of the furniture.
- 5.4 Mention the use of color scheme of furniture.

6 Understand the plywood.

- 6.1 Mention the general features of plywood.
- 6.2 Mention the advantages of plywood.
- 6.3 Describe the dimensions of plywood.
- 6.4 Mention the use of nails and screws in plywood.
- 6.5 Describe the process of the removing nails from plywood.
- 6.6 Describe the contemporary materials Glass, Cane, Steel, Fiber Glass, Plastic Materials.

7 Understand molding and fasteners.

- 7.1 List the common molding patterns.
- 7.2 Mention the uses of common molding patterns.
- 7.3 Mention two major purposes of fasteners.
- 7.4 Describe the uses of nail and screw.
- 7.5 Describe the advantages of screws as compared with neils.
- 7.6 List different types of equipment used in molding.

8 Understand the gluing and clamping.

- 8.1 Describe gluing and clamping.
- 8.2 List the factors for selecting different kind of adhesive.
- 8.3 Describe the moisture content of wood affect its gluing properties.
- 8.4 Describe different kinds of adhesive.
- 8.5 List the common clamping devices.
- 8.6 Describe gluing procedure.

Practical:

1 Perform the sketch of the tabletops.

- 1.1. Sketch five kinds common edge treatments for plywood.
- 1.2. Sketch edge treatments for hardwood plywood.
- 1.3. Sketch some typical edges for tabletops.
- 1.4. Sketch some common methods of fastening the tops of furniture.
 - a. Rabbeted blocks or wood buttons.
 - b. Metal table top fasteners
 - c. Wood screws through web or skeleton frame.
 - d. Angle irons.
 - e. Wood screws through pocket holes in the rails.
 - f. Desktop clips.

2 Perform different types of furniture making joint.

- 2.1 Make a butt joint by use of wood.
- 2.2 Make a edge joint by use of wood.
- 2.3 Make a rabbet joints by use of wood.
- 2.4 Make a dado joints by use of wood.
- 2.5 Make a lap joints by use of wood.

- 3 Perform the finishing by using finishing equipment and supplies.**
 - 3.1 Apply the technique of spray gun for finishing works.
 - 3.2 Apply the technique of using spray gun in a small booth.
 - 3.3 Find out the possible cause of spray painting troubles.
 - 3.4 Find out the remedies of the sags, streaks, orange-peel and excessive paint loss.

- 4 Perform the sketching of the historical furniture style (Queen Anne).**
 - 4.1 Sketch the different forms of the foot hoof.
 - 4.2 Sketch the pad trifold & slipper.
 - 4.3 Sketch scroll tops on chests.
 - 4.4 Sketch scalloped shells on knees of legs and crests of chairs.

- 5 Perform the sketching of molding & fasteners.**
 - 5.1 Sketch different types of molding.
 - 5.2 Sketch different types of nails with their dimension.
 - 5.3 Sketch different types of head screws with their dimension.
 - 5.4 Sketch different types of hardware & fasteners.

- 6 Perform the drawing of different types of chair.**
 - 6.1 Sketch a chair using straight wood.
 - 6.2 Sketch early Windsor chair.
 - 6.3 Sketch different types of seat according to various rest postures.
 - 6.4 Sketch too high seat, seat of denote and too low seat.
 - 6.5 Draw a relationship between height of dining table and chair.

- 7 Perform the drawing of different types of Residential furniture.**
 - 7.1 Draw the plan of sofa set with dimension.
 - 7.2 Draw showcase with dimension.
 - 7.3 Draw plan & elevation of different types of bed with dimension.
 - 7.4 Draw plan & elevation of different types of bookshelf with dimension..
 - 7.5 Sketch plan & elevation of different types of dining table with dimension.

REFERENCE BOOKS

1. Furniture and Cabinet Making
– by John L. Felirer.
2. Basic Principles of Furniture Design with focus on Wooden Furniture
– by Jim Kenmoci.
3. Interior Design on Introduction to Architectural Interior
– Third edition, Arnold Friedman.

8773	CONSTRUCTION DOCUMENTATION AND PROFESSIONAL PRACTICES	T	P	C
		2	0	2

AIMS

- To be able to understand the Pre-tender and Post-tender planning.
- To be able to prepare prequalification documents.
- To be able to evaluate prequalification documents.
- To be able to prepare technical specifications.
- To be able to prepare tender documents.
- To be able to develop knowledge, skill and attitude of evaluating tenders and preparing comparative statement.
- To be able to understand the concept of e-tendering.
- To be able to understand the PPR & PPA.
- To be able to develop knowledge of architectural and interior design profession.
- To be able to develop knowledge of working drawing and schedule preparation.
- To be able to acquire knowledge of the role of designer in an interior firm.

SHORT DESCRIPTION

Pre-tender and Post-tender planning; Tender document; Tender notice; Instruction to tender; Contract clauses/condition of contract; Technical specifications of materials and works; Pre-qualification of contractors; Evaluation and comparative statement; Contract agreement. Architectural and interior design profession; Working organization; Development of professional practices; nce; Building laws; Architect's and designer's services; Design; Estimation; Working drawing and specification; General condition; Role of designer.

*DETAIL DESCRIPTION*Theory:**1. Understand the pre-tender and post-tender planning.**

- 1.1 Define pre-tender planning.
- 1.2 State the objectives of pre-tender planning.
- 1.3 List the activities of pre-tender planning.
- 1.4 Define post-tender planning.
- 1.5 List the activities of post-tender planning.
- 1.6 Explain anticipation of award.
- 1.7 Define evaluation of contract.
- 1.8 Explain the silent features of evaluation. of contract.

2. Understand the concept of tender documents.

- 2.1 State the meaning of tender document
- 2.2 Mention the characteristics of ideal tender document
- 2.3 Describe the procedure of preparation of tender document.
- 2.4 Explain different methods of contract for works.
- 2.5 Explain the following Contents of the tender documents:

- Tender Notice
- Instruction to Tenderers (ITT)
- Bill of Quantities (BOQ)
- Construction time period
- Tender Form
- Form of Agreement
- General Conditions of Contract (GCC)
- Special Conditions of Contract (SCC)
- Technical specifications
- Date of Site Possession and Mobilization
- Period of commencement of work
- Period of Completion
- Security deduction
- Liquidated damages and penalty for delay in completion of the work
- Condition of engagement of a sub-contractor.
- Quality control clauses
- Time schedule of work
- Day work
- Arbitration
- Extension of completion period
- Termination
- Maintenance period

3 Understand the meaning of tender notice.

- 3.1 Define tender notice.
- 3.2 Mention different types of tender notice.
- 3.3 Mention the particulars needed for a tender notice.
- 3.4 State the meaning of comparative statement.
- 3.5 Mention the advantage of preparing comparative statement.
- 3.6 Define pre-bid meeting.

4. Understand the Instruction to Tenderers (ITT) and

- 4.1 Interpret the following terms used in ITT:
 - (a) Scope of Tender
 - (b) Source of Funds
 - (c) Eligible Bidders
 - (d) Qualification of the Bidder
 - (e) Amendment of Tender Documents
 - (f) Language of Tender
 - (g) Documents Comprising the Tender
 - (h) Tender Prices
 - (i) Currencies of Tender and Payment
 - (j) Tender Validity
 - (k) Tender Security
 - (l) Format and Signing of Tender
 - (m) Sealing and Marking of Tenders
 - (n) Deadline for Submission of Tenders
 - (o) Late Tenders
 - (p) Modification and Withdrawal of Tenders
 - (q) Tender Opening

- (r) Evaluation of Contract
- (s) Force major
- (t) Earnest money/ Tender Security
- (u) Award Criteria
- (v) Performance security.

5. Understand the pre-qualification of contractors.

- 5.1 Define pre-qualification of contractors.
- 5.2 Describe the aim of prequalification of contractors
- 5.3 State the features of prequalification notice
- 5.4 Describe the procedure of preparation of pre-qualification Document.
- 5.5 Mention the prequalification criteria
- 5.6 Explain the procedure of preparation of evaluation criteria of pre-qualification document
- 5.7 Describe the process of evaluation of prequalification applications submitted by the intending contractors

6. Understand the evaluation and Comparative Statement of Tenders

- 6.1 Describe the tender opening procedure including preparation of opening memo.
- 6.2 Explain the process of examination of tenders and determination of responsiveness
- 6.3 Explain the process of evaluation and comparison of tenders.

7. Understand the Concept of e-tendering.

- 7.1 Define e-tender.
- 7.2 Describe the purpose of e-tender
- 7.3 Mention the advantage and disadvantage of e-tender
- 7.4 Describe the process of preparing e-tender.
- 7.5 Describe the importance of e-tendering in Bangladesh.

8. Understand the recent public procurement rules(PPR) implemented by the govt. of Bangladesh

- 8.1 State the back ground of PPR development in Bangladesh.
- 8.2 State the meaning of the following: PPR, ITT, TDS, GCC, PCC, NOA, BOQ, TEC, TOC, HOPE, CS, OTM, RFQ, DPM, PTU.
- 8.3 Describe the preparation of Standard tender document for works.
- 8.4 Describe the preparation of Standard tender document for goods.
- 8.5 Describe the process of tender submission.
- 8.6 Describe the process of evaluation of tender documents.

9. Understand the architectural and interior design profession.

- 9.1 Define architecture and architect.
- 9.2 Define interior design and designers.
- 9.3 Explain the related field of interior designer.
- 9.4 State the relationship between in the architect and interior design.
- 9.5 State the relationship between in employees and employer and others professions.

10 Understand the professional practice.

- 10.1 Define professional ethics.
- 10.2 State the professional societies.

- 10.3 Explain the certification and registration.
- 10.4 Describe the contents of examination for certification / registration.
- 10.5 Describe the architects and interior designers in training.

11 Understand the development of architectural / designers practices.

- 11.1 Define development (professional).
- 11.2 Describe the process of development.
- 11.3 Explain the securing commissions.
- 11.4 Explain the process of making public relation.
- 11.5 Discuss publicity.
- 11.6 Discuss the relations with client and architect / designers.

12 Understand the building laws/Bylaws.

- 12.1 Define law (in general) and ethics.
- 12.2 Compare the law and ethic.
- 12.3 Describe briefly the building by laws / building codes.
- 12.4 Define contracts.
- 12.5 Discuss the importance and process of making contracts.
- 12.6 Discuss the professional agreement.
- 12.7 Distinguish between the contracts and agreements.
- 12.8 Discuss the owner architect agreement.
- 12.9 Discuss the owner contractor agreement.
- 12.10 Explain the proposals.
- 12.11 Explain proposals.
- 12.12 Explain the procedure of laundering and instruction of bidding.

13 Understand the compensation for architects / Designers service.

- 13.1 Define the selection of architects.
- 13.2 Discuss the methods of architect's selection.
- 13.3 List the types of compensation / fees.
- 13.4 Describe the different types of steps of taking compensation / fees.
- 13.5 Discuss the advantages and disadvantages of different compensation / fees.
- 13.6 Explain the copyrighting documents.
- 13.7 Explain the applicable legal provision.

14 Understand the role of designer in an interior firm.

- 14.1 Describe the responsibility of diploma engineer in on interior firm.
- 14.2 Describe the importance of site visit for developing the professional work.
- 14.3 Discuss the responsibility of diploma engineer on site.
- 14.4 Discuss the stage of site visit by designer.
- 14.5 Discuss the role of designer of site.

REFERENCE BOOKS

1. Introduction to Building Management (Fifth Edition)
- RE Calvert
2. The Site Agents Hand Book
- RHB Ranns

3. Building Organization & Procedures (Second Edition)
- G Froster
4. Building Production and Project Management
- R A Burgess and G White
5. The Resume of Building Construction & Management with CPM (Construction Concept)
- Mohammed Ali Siddiquee

6. Architectural Practice
- Clintorn H. COWHILL A. I. A
BEN JOHN SMALL A. I. A
Reinhold Publishing Corporation
New York.

6165 LANDSCAPE DESIGN

T	P	C
1	3	2

AIMS

- Understand the fundamentals of landscape design
- Use of Land and water, Vegetation.
- Importance of Climate, site, spaces, visible landscape, and circulation.
- Layout of water bodies, landscape & visit the site,
- Prepare a landscape model.

SHORT DESCRIPTION

Fundamentals of landscape; Use of land & water; Importance of Site, Spaces, Visible landscape, and Circulation. Layout of water bodies, landscape & visit the site.

DETAIL DESCRIPTION**1.0 Understand the fundamentals of landscaping.**

- 1.1 Describe the historical background of human animal.
- 1.2 Describe the importance of nature in landscape.
- 1.3 Describe the necessity of ecological basis.
- 1.4 Explain the landscape character.
- 1.5 Explain the natural forces, forms and feature.
- 1.6 Explain the importance of the built-environment.

2.0 Understand the use of land and water.

- 2.1 Describe the land as heritage and as resource.
- 2.2 Describe the importance of land surveying.
- 2.3 Discuss various uses of land and water.
- 2.4 Describe the planning problems and possibilities of water.
- 2.5 Explain water as resource and as landscape feature.
- 2.6 Discuss water management.
- 2.7 Describe different elements of water related to the site design.

3.0 Understand the importance of vegetation.

- 3.1 Describe different elements of plants in nature.
- 3.2 Discuss the importance and necessity of plantation and gardening.
- 3.3 Describe the planned and planted landscape.
- 3.4 Differentiate between the micro and macro climate.
- 3.5 Describe the effect of climate on plants.

4.0 Understand the importance of climate.

- 4.1 Describe the physical characteristics of climate.
- 4.2 Describe the social characteristics of climate.
- 4.3 Describe the planning consideration of landscape.
- 4.4 Describe the common denominators of climate.
- 4.5 Describe the possibilities of site planning for energy conservation as-
 - 4.5.1 Reduction of heat loss,
 - 4.5.2 Reduction of cooling requirements, &

4.5.3 Utilization of natural thermodynamics.

5.0 Understand the Site.

- 5.1 Define site and describe the site selection.
- 5.2 Compare the alternative sites and the ideal site.
- 5.3 Define site analysis and list out the procedure of systematic site analysis.
- 5.4 Discuss specification for topographic survey and mention the required information.
- 5.5 Describe the environmental impact assessment.
- 5.6 Explain the conceptual plan with diagram of the planning-design process.
- 5.7 Explain the terms of site systems.
- 5.8 Describe the site development guidelines (A checklist of helpful considerations).

6.0 Understand the Spaces.

- 6.1 Define site volumes.
- 6.2 Describe the spatial impact, spatial qualities, size, form and color.
- 6.3 Explain abstract spatial expression and definitions of volumes.
- 6.4 Distinguish the base plane and the overhead plane with examples.
- 6.5 Define the verticals.
- 6.6 Describe the verticals as enclosure for privacy.
 - 6.6.1 Qualities of enclosure.
 - 6.6.2. Visual control
- 6.7 Explain elements within a volume.
- 6.8 Describe the structures as vertical elements, the vertical as - a point of reference, in relation to pix, articulators, controlling elements, plant materials, effective enclosure, and an axiom.

7.0 Understand the visible landscape.

- 7.1 Define view and vista with their components.
- 7.2 Describe the axis and the axial characteristics.
- 7.3 Explain the axis as unifying elements with the example.
- 7.4 Explain symmetrical plan, dynamic symmetry, the despotism of symmetry and the nature of symmetry.
- 7.5 Describe the asymmetrical plan, visual balance, asymmetric planning, organic growth & planning and the use of asymmetry.
- 7.6 Explain the visual resource management.

8.0 Understand the circulation.

- 8.1 Define motion
- 8.2 Discuss motion impelled by form and concept and the kinematics of motion.
- 8.3 Explain the pedestrian traffic and the planning consideration of pedestrian traffic-things seen, base plane, distance and grade and traffic flow.
- 8.4 Explain the automobile traffic and the planning consideration of automobile traffic-the road way, approach drive, entrance court and the parking compound.
- 8.5 Describe the rain, water and air movements.

PRACTICAL

1.0 Prepare a layout plan by visit the site.

- 1.1 Visit a given site and present a report about the site with photographs.
- 1.2 Draw the site plan showing existing structure,

- 1.3 Draw different roads and pavement and drive way.
- 1.4 Draw the parking of the site.
- 1.5 Sketch the surface water drainage and disposal plan of the given plot.

2.0 Prepare the layout of pools, fountain, low and high land and water bodies.

- 2.1 Sketch the different earth forms.
- 2.2 Sketch the various types of slope retention.
- 2.3 Sketch the docks, decks, overlooks, terraces and balconies on the slope of the banks.
- 2.4 Sketches the slope treatment or water edge detail of different water bodies.
- 2.5 Sketches the pools, fountain and cascades.
- 2.6 Draw the plan and section of a swimming pool.

3.0 Prepare a landscape plan of a room corner or garden or park.

- 3.1 Visit a park and find out the point of renovation and present a report on it with photographs.
- 3.2 Sketches the plan and elevation of some small plants, trees (canopy, intermediate, shrubs, vines and ground covers) and bushes.
- 3.3 Draw the form and space modulation of plants.
- 3.4 Sketches the trees as screen, natural shading device, slope and watershed protection, noise abatement and ornamentation.
- 3.5 Design a corner of a room/ a lobby/ a mini garden/ a lawn corner / a terrace corner with plants, seats and small pool or fountain.

4.0 Prepare a site plan.

- 4.1 Draw a topographic survey map.
- 4.2 Draw a site analysis map.
- 4.3 Draw the wind movement and sun path diagram.
- 4.4 Draw the site schematic plan.
- 4.5 Draw a final site plan.

5.0 Design a canopy or a fountain as a landscape element with model.

- 5.1 Draw the plan of the canopy/fountain.
- 5.2 Draw the elevation of the canopy/fountain.
- 5.3 Sketch a 3D view (isometric/perspective) of the canopy/fountain.
- 5.4 Make a model of the canopy/fountain.

Ref:

- Landscape Architecture, John Ormsbee Simonds

AIDT- 8774	INTERIOR PROJECT	T	P	C
		0	6	2

AIMS

- To be able to understand the Individual building.
- To be able to understand the Related drawings.
- To be able to understand the Operate an Interior Project.
- To be able to develop knowledge, skill and attitude of preparing different types of Interior Project.

SHORT DESCRIPTION

Site Analysis, Preliminary Sketch, Working Drawing, Finishing Schedule, Interior Perspective drawing, Model, Brochure.

DETAIL DESCRIPTION

Practical:

Each student has to submit the following things of any one of the given project:

- A brochure containing all necessary drawings, Photographs of Model of the project, detail estimated cost of the project.
- A detail model & Interior Perspective drawing of the project.

PROJECT:

Residential Apartment/ Office building/Shopping Centre/ Restaurant/ School building.

1 Draw preliminary site investigation and analysis.

- 1.1 Make the site inventory and resource analysis.
- 1.2 List the consideration of the site.
- 1.3 Make the topographical survey of the site.
- 1.4 Draw the sun path diagram
- 1.5 Sketch the landscaping elements of the site.

2 Perform preliminary sketch of the project.

- 2.1 Draw the location Map of the Site.
- 2.2 Draw bubble diagram of the project .
- 2.3 Sketch line diagram of the typical floor .
- 2.4 Sketch the free hand perspective view of the project.

3 Prepare presentation drawing of the project.

- 3.1 Draw the floor plan with furniture arrangement and rendering .
- 3.2 Draw the elevations with rendering.
- 3.3 Make a interior perspective of the project.
- 3.4 Make a brief description of the project with rough estimated cost.
- 3.5 Make a brochure with above topics for approval of the client.

- 4 Perform working drawing of the project.**
 - 4.1 Draw floor plans with detail dimension in 1:50 scale .
 - 4.2 Draw different sections with detail dimension in 1:50 scale.
 - 4.3 Draw floor plan showing different types of furniture with dimension in 1:100 scale.
 - 4.4 Draw detail plan & elevation showing different types of sofa with dimension use in interior design.
 - 4.5 Draw detail plan & elevation of different types of dinning table with dimension use in interior design.
 - 4.6 Draw detail plan & elevation of different types of bed with dimension use in interior design.

- 5 Perform detail drawing of the Toilet.**
 - 5.1 Draw the detail plan of the toilet showing different fixture with detail dimension in 1: 25 scale.
 - 5.2 Draw vertical section of the Toilet showing detail dimension in 1: 25 scale.
 - 5.3 Make a finishing schedule of the toilet.

- 6 Perform detail drawing of the Kitchen.**
 - 6.1 Draw the detail plan of the Kitchen showing different fixture with detail dimension in 1: 25 scale.
 - 6.2 Draw sectional elevation of the kitchen showing detail dimension in 1: 25 scale.
 - 6.3 Make a finishing schedule of the kitchen.

- 7 Prepare detail drawing of the stair.**
 - 7.1 Draw the detail plan of the stair showing detail dimension in 1: 25 scale.
 - 7.2 Draw vertical section of the stair showing detail dimension in 1: 25 scale.
 - 7.3 Draw the railing section and hand rail in 1:10 scale.
 - 7.4 Draw the detail section of the tread and riser in 1: 10 scale.

- 8 Prepare detail drawing of the door & windows.**
 - 8.1 Draw the detail plan of the door & windows use in the project showing detail dimension in 1: 25 scale.
 - 8.2 Draw vertical section of the door & windows showing detail dimension in 1: 25 scale.
 - 8.3 Draw the necessary detail of the door & windows in 1:10 scale.
 - 8.4 Draw the detail fixing arrangement of door & windows in 1: 10 scale.

- 9 Prepare Perspective drawing of the project.**
 - 9.1 Draw the interior perspective of the different rooms.
 - 9.2 Draw the interior perspective of the bath room.
 - 9.3 Draw the interior perspective of the kitchen.
 - 9.4 Draw the interior perspective of the Entrance/ lobby.

- 10 Prepare detail Reflected ceiling of the project.**
 - 10.1 Draw the Reflected ceiling plan of the different rooms.
 - 10.2 Draw the section of Reflected ceiling of the different rooms.
 - 10.3 Draw the detail fixing arrangement of the Reflected ceiling.
 - 10.4 Draw the necessary part detail of the Reflected ceiling.

- 11 Prepare wall and floor finishing of the project.**
 - 11.1 Draw the detail elevation of the wall using glass, tiles, aluminium, wood, alcobond in 1:25 scale.
 - 11.2 Draw the section of the wall in 1:25 scale.
 - 11.3 Make a detail floor plan using modern materials tiles, marbel, wood, glass, mosaic in different patterns.

11.4 Draw the details part section in wall and floor.

12 Prepare schedule of the project.

12.1 Make a finish schedule of the project.

12.2 Make door window schedule of the project.

12.3 Draw the bar chart of the project.

12.4 Arrange a CPM & PERT for the project.

12.5 Draw a color wheel using different color for the project.

REFERENCE BOOKS

4. Time saver standard for Interior Design
– by Joseph D Chira.
5. Time saver standard for Building Type
– by Joseph D Chira.
6. Interior Design on Introduction to Architectural Interior
– Third edition, Arnold Friedman.

6453	ENVIRONMENTAL ENGINEERING-I	T	P	C
		2	3	3

AIMS

- To enable to select suitable methods for collection and distribution of water from given source to given community.
- To enable to identify impurities of water of given sources and selected suitable method/methods of purification up to potable standard.
- To assist in comparing various types of water pipes and pipe fittings.
- To develop understanding of the procedure of construction, repair, replacement and maintenance of water supply systems.
- To provide understanding of the socio-economic aspect of water supply and sanitation(WSS).

SHORT DESCRIPTION

Introduction; Water requirements; Sources of water; Water pipes; Collection and transmission of water; Quality of water; Treatment of water (clarification); Treatment of water (filtration); Treatment of water (disinfection); Treatment of water (softening); Miscellaneous water treatment; Water distribution; Water reservoir; Distribution system; Rural water supply system; Plumbing system; Socio-economic aspects of water supply and sanitation(WSS).

DETAIL DESCRIPTION**Theory:**

- 1 Understand the concept of environmental engineering.**
 - 1.1 Define environmental engineering.
 - 1.2 State the branches of environmental engineering.
 - 1.3 Explain the scope of environmental engineering.
 - 1.4 Describe the importance of environmental engineering for civil engineers.
 - 1.5 State the role of civil engineers to maintain a healthy environment.
- 2 Understand the various aspects of consumption of water.**
 - 2.1 Describe population prediction and various methods of population forecast.
 - 2.2 Describe the various needs for clean water and list the quantities required for those purposes.
 - 2.3 Explain the influence of the factors which affect per capita consumption of water:
 - a. Size of city
 - b. Characteristics of population
 - c. Industries and commercial organization
 - d. Climatic condition
 - e. Metering of water
 - 2.4 Explain the demand of water for fire fighting and fire stand post.
- 3 Understand the different sources of water.**
 - 3.1 Identify different sources of water.
 - 3.2 Explain the hydrological cycle.
 - 3.3 State the advantages and disadvantages of ground water.
 - 3.4 Mention the advantages and disadvantages of surface water.
 - 3.5 Distinguish between the ground water supply and surface water supply in respect to quality of water.
 - 3.6 Explain rainwater harvesting

- 4 Understand the different type of pipes & pipe joints used in water supply and the reasons for corrosion in metal pipes.**
- 4.1 Classify the different type of pipes according to size, materials, quality, and allowable stresses used in Bangladesh.
 - 4.2 Explain the causes of corrosion of metal pipes.
 - 4.3 Describe the methods of prevention and protection against corrosion.
 - 4.4 Explain the causes of deterioration in non-metal pipes.
 - 4.5 Describe with sketches the different joints used in pipes.
 - 4.6 Describe with sketches the fittings of pipes and valves used.
- 5 Understand the collection and transmission system of water.**
- 5.1 Identify the different types of intake used in collecting surface water.
 - 5.2 Describe the different intake systems with sketches.
 - 5.3 Classify the different type of pumps used in water supply.
 - 5.4 Explain the uses and limitations of different type of pumps.
 - 5.5 Distinguish between turbine pump and submersible pump used in deep tube well.
- 6 Understand the various types of impurities in water.**
- 6.1 State the different type of impurities present in water.
 - 6.2 Explain the causes of turbidity, color, taste and odor in water.
 - 6.3 Mention the effects and maximum allowable limits(WHO & BSTI) of impurities (pH, colour, Turbidity, TDS, SS, Hardness, chloride, Nitrate, Iron, Sodium, Arsenic, Cadmium, lead, total coliform and faecal coliform) in water.
 - 6.4 Explain the causes and effects of alkalinity, acidity and hardness in water.
 - 6.5 Describe the effects of gaseous impurities(carbon di-oxide, hydrogen sulphide, dissolved oxygen) in water.
 - 6.6 Mention the causes and effects of nitrate (methemoglobinemia) and lead poisoning (plumbism) in water.
- 7 Understand the safe water.**
- 7.1 Define safe water.
 - 7.2 Mention the common water borne diseases.
 - 7.3 Explain the relationship between safe water and health.
 - 7.4 List the different types of micro-organisms found in water.
 - 7.5 State the relationship between pathogenic bacteria and e-coli bacteria (indicator organism).
 - 7.6 Describe the contamination of water due to cross connection and plumbing defects, storage and back syphonage.
- 8 Understand the treatment of water by clarification.**
- 8.1 Explain a typical flow diagram of treatment plant units.
 - 8.2 Outline the need of screening of water.
 - 8.3 Mention the principle of plain sedimentation.
 - 8.4 Mention the principle of sedimentation with coagulation.
 - 8.5 State different types of coagulants with their purpose and action.
 - 8.6 Describe the process of flocculation.
 - 8.7 Describe a typical sketch of sedimentation tank.
- 9 Understand the treatment of water by filtration.**
- 9.1 Explain the need of filtration of water.
 - 9.2 State the theory of filtration of water for bacteriological removal.
 - 9.3 Explain the characteristics between the slow sand filter and rapid sand filter.
 - 9.4 Describe the operation difficulties of slow sand and rapid sand filters.
 - 9.5 State the meaning of negative head and mud balls.

- 10 Understand the treatment of water by disinfection.**
- 10.1 Describe disinfection of water by chlorination.
 - 10.2 Explain the advantages and limitations of disinfection of water by chlorination.
 - 10.3 Compare the pre-chlorination, post chlorination, double chlorination and super chlorination.
 - 10.4 Explain the advantages of break point chlorination.
 - 10.5 Describe the following methods of disinfection of water:
 - a. Heating and boiling
 - b. pH control
 - c. Using oxidizing agent
 - d. Ultra violet Ray
 - e. Ozone
- 11 Understand the treatment of water by softening.**
- 11.1 Distinguish between hard and soft water.
 - 11.2 Explain the need of softening water.
 - 11.3 list different processes of water softening
 - 11.4 Describe the method of Ion-exchange process water softening
- 12 Understand the different processes of removing color, odor, taste, arsenic, iron, manganese and salinity.**
- 12.1 Explain the purpose of aeration.
 - 12.2 Describe the different methods of aeration.
 - 12.3 Describe the techniques of controlling algae and other aquatic growth.
 - 12.4 Describe the process of removal of color, odor and taste by activated carbon.
 - 12.5 Explain the different methods of removing arsenic, iron and manganese with flow diagram.
 - 12.6 List the different methods of desalination of water.
- 13 Understand the different water distribution methods.**
- 13.1 State the different features of the distribution systems.
 - 13.2 Describe with the help of sketches the different methods of supply of water.
 - 13.3 Outline the advantages and disadvantages of different methods of supply of water.
 - 13.4 Describe with sketches the different layout methods of distribution pipes.
 - 13.5 Explain the relative advantages and disadvantages of different layout methods of distribution pipes.
 - 13.6 State the different types of-
 - a. Meter
 - b. Valves
 - c. Fire hydrant
 - d. Pipe & Fittings.
- 14 Understand different types of reservoir.**
- 14.1 Mention the different types of reservoir according to position and shape.
 - 14.2 Explain the needs of roof tank and typical water reservoir in a building.
 - 14.3 Describe the typical section of roof tank and water reservoir in a building.
- 15. Understand the construction and maintenance of distribution system.**
- 15.1 Describe the procedure of excavation and back filling for laying pipe lines.
 - 15.2 Describe the procedure for-
 - a. handling and laying pipes and their maintenance
 - b. placing and maintenance of hydrants and valves
 - c. cleaning of water mains and use of washout system.

16 Understand the water supply systems with specific reference to rural Bangladesh.

- 16.1 Give introduction to different types of hand pumps: No. 6 hand pump, deep-set(tara) pump.
- 16.2 Describe the procedure of drilling, aquifer selection, back filling and installation techniques including developing of new tube well.
- 16.3 Explain the design procedure of tube well strainer.
- 16.4 Describe operation & maintenance of No. 6 hand pumps and deep-set(tara) hand pumps.
- 16.5 Explain the drilling problems in rocky areas.
- 16.6 Give introduction to alternative technologies in problem areas of Bangladesh: Shallow Shrouded Tube well(SST), Very Shallow Shrouded Tube well(VSST), Pond Sand Filter(PSF), Infiltration Galaries(IG), Iron Removal Unit (IRU) and Deep-set technologies.

17 Understand the importance of plumbing system.

- 17.1 Define plumbing system.
- 17.2 List the requirements of plumbing installation.
- 17.3 Identify with sketches the various plumbing fittings and fixtures.
- 17.4 Describe the uses of various plumbing fittings and fixtures.
- 17.5 Differentiate between plumbing fittings and fixtures.
- 17.6 List the tools required for plumbing works.
- 17.7 Mention the uses and maintenance of various plumbing tools.

18 Understand the effect of socio-economic factors on water supply and sanitation.

- 18.1 Describe the socio-economy of rural and urban area in Bangladesh.
- 18.2 Give definitions of demographic characteristics, power structure, cultural issues (traits), rural leadership and local government structure.
- 18.3 Describe the influence of socio-economic aspects on community water supply and sanitation.

Practical:

1 Identification of pipes and fittings.

- 1.1 Identify physically different type of pipes, fittings and joints.
- 1.2 Draw the sketches of typical plumbing fittings.
- 1.3 Cut pipes and cut a thread on the pipe.
- 1.4 Inspect installations to identify good and poor quality materials and workmanship

2 Demonstration of water purification plant and deep tube well.

- 2.1 Draw flow diagram of water purification processes after visiting a plant.
- 2.2 Draw section through a deep tube well.
- 2.3 Identify the major precautions needed during installation and use of deep tube well.

3 Maintenance works.

- 3.1 Identify, take out and replace unserviceable fixtures/ fittings or any other component parts.
- 3.2 Identify the common troubles of submersible pump and their solutions. after visiting pump house.
- 3.3 Identify the common troubles in water supply pipe lines and their solution by visiting concern authorities (WASA, City Corporation and Pourashava).

4 Conduct physical and chemical tests of water.

- 4.1 Conduct physical tests of water (pH value & turbidity) using field pH and turbidity meter.

- 4.2 Conduct chemical tests of water (iron, manganese and chloride) using field kits.
- 4.3 Conduct the arsenic test of water using field kits.
- 4.4 Conduct residual chlorine test using field kits.
- 4.5 Conduct hardness test using field kits.

5 *Physically identify different parts of*

a)No. 6 hand pump,

b)deep-set (tara) hand pumps.

c) Submersible pump

6. Inspect installation of

a)No. 6 hand pump,

b)deep-set (tara) hand pumps.

c) Submersible pump

REFERENCE BOOKS

1. **Rangawala, S.C(2009): Water supply and sanitation. (Environmental Engineering)**
2. **Azizul, Syed Haq (2006): Plumbing Practices.**
3. **Feroze, M. Ahmed & Mujibur, M. Rahman (2000): WATER SUPPLY & SANITATION: RURAL AND LOW INCOME URBAN COMMUNITIES, ITN-BANGLADESH Publication.**
4. **Plumbing (1991): Technical Teachers Training College Publication.**
5. **Aziz, M.A (1975) : Water supply and sanitation.**

6463 DESIGN OF STRUCTURE - I

T	P	C
3	3	4

AIMS

- To be able to understand the properties of reinforced cement concrete (RCC).
- To be able to select the suitable size of reinforced concrete beams & lintels with reinforcement.
- To be able to supervise the placing of reinforcement for beams & lintel.

SHORT DESCRIPTION

Reinforced cement concrete; Theory of bending; Investigation of beam; Shear stress and bond stress; Design of reinforced cement concrete rectangular beam, T-beam, double reinforced beam and lintel.

DETAIL DESCRIPTION**Theory:**

- 1 Understand the different type of cement concrete works.**
 - 1.1 Describe the plain concrete, reinforced concrete and prestressed concrete.
 - 1.2 Describe the different uses of the plain concrete, reinforced concrete and prestressed concrete.
 - 1.3 Mention the advantages, disadvantages & limitations of the plain concrete.
 - 1.4 Mention the advantages, disadvantages & limitations of the reinforced concrete.
 - 1.5 Mention the advantages, disadvantages & limitations of the prestressed concrete.
- 2 Understand the structural safety, design code and safety provision.**
 - 2.1 Explain the need for structural safety.
 - 2.2 Solve simple problems using the design codes.
 - 2.3 Explain the necessity for safety provision.
- 3 Understand about the loads in designing reinforced concrete works.**
 - 3.1 Define the meaning of load.
 - 3.2 Classify different kinds of loads.
 - 3.3 Define Richter scale, tectonic plate and epicenter.
 - 3.4 Explain the necessity of considering the seismic load and wind load in designing reinforced concrete works.
 - 3.5 Mention the significant of the thrust (like tidal, cyclones etc.) to be consider in designing reinforced concrete structure in coastal zone.
- 4 Understand stress, strain and elasticity of concrete.**
 - 4.1 State the meaning of stress, strain, ultimate stress and allowable stress of concrete.
 - 4.2 Define young modulus of elasticity of concrete.
 - 4.3 Calculate young modulus of elasticity of concrete.
 - 4.4 Interpret stress-strain curve of steel and concrete.
 - 4.5 Mention the purpose of compression test of concrete.
 - 4.6 State the different size & shape of moulds for compression test.
 - 4.7 Describe test procedure of crushing cubes and cylinders for compression test.
 - 4.8 Determine ultimate stress of concrete (f_c) and allowable stress of concrete (f_c).

4.9 Determine the allowable shear stress of concrete using ultimate stress of concrete.

5 Understand the properties & behavior of reinforcing steel used in RCC.

5.1 List the different types & grades of steel used in RCC and prestressed concrete.

5.2 Mention the advantages of uses of mild steel in RCC.

5.3 Describe the scope of using welded wire fabric in RCC.

5.4 Mention the characteristics of plain bar, deformed bar and twisted bar and tendon.

5.5 Mention the advantages of uses of deformed and twisted bar in RCC.

5.6 State the minimum reinforcement used in RCC beam and slab.

6 Understand the flexure formula of homogeneous beam.

6.1 Define resisting moment.

6.2 Explain the stress diagram of a loaded beam.

6.3 Identify compression and tension zones of a homogenous beam.

6.4 Express the derivation of the flexure formula for homogeneous beam.

6.5 Solve the problems on homogeneous rectangular beam.

7 Understand the concept of transformed section of beam.

7.1 Define transformed section.

7.2 Explain the theory of transformed section with sketches.

7.3 Express the derivation of the equation for investigating the stresses developed in concrete and steel by transformed section method.

7.4 Calculate the stresses developed in rectangular beam and T-beam in WSD method.

7.5 Explain balanced reinforced beam, under reinforced beam and over reinforced beam.

7.6 Mention the effect of under reinforcement and over reinforcement in RCC beams.

8 Understand the flexure formula for RCC beam in working stress design (WSD) method.

8.1 State the assumptions used in developing the flexure formula.

8.2 Explain the stress diagram of a loaded RCC beam.

8.3 Mention the notations used in flexure formula in WSD method.

8.4 Express the derivation of the flexure formula for RCC beam in WSD method.

8.5 Solve problems of flexure formula based on WSD method.

9 Understand the shear stress developed in RCC beams.

9.1 Explain the effects of shear force and stress in RCC beams.

9.2 State the meaning of diagonal tension.

9.3 Explain the causes of creating diagonal tension in RCC beams.

9.4 Express the derivation of the formula to determine shear stress developed in RCC beams.

9.5 Solve the problems on shear stress developed in WSD method.

9.6 Solve the problems on shear stress developed in USD method.

9.7 Mention the allowable shear stress for RCC beam (v) and shear stress for concrete (v_c).

10 Understand the functions of web reinforcement in RCC beams.

10.1 Define web reinforcement.

10.2 Classify web reinforcement with sketches.

10.3 Mention the functions of web reinforcement in RCC beams.

10.4 Determine the spacing of web reinforcement (vertical & inclined) in WSD method.

10.5 Determine the spacing of web reinforcement in USD method.

10.6 Determine the portion of the RCC beam requiring web reinforcement.

11 Understand the bond stress developed in RCC beams.

11.1 State the meaning of bond stress.

- 11.2 Express the derivation of the formula to determine bond stress developed in RCC beams.
- 11.3 State the allowable bond stress for plain bar and deformed bar in WSD and USD methods.
- 11.4 Determine the anchorage length of reinforcement in RCC.
- 11.5 Explain the necessity of standard hooks of reinforcement in RCC.

12 Understand the design of RCC rectangular beam in WSD method.

- 12.1 Outline the design steps of RCC rectangular beam in WSD method.
- 12.2 State the minimum spacing of reinforcing bars in RCC beam.
- 12.3 Design a simply supported RCC rectangular beam in WSD method.
- 12.4 Design a semi-continuous RCC rectangular beam in WSD method.
- 12.5 Design a continuous RCC rectangular beam in WSD method.

13 Understand flexure formula in ultimate strength design (USD) method.

- 13.1 Differentiate WSD and USD method.
- 13.2 Explain the stress diagram of loaded beam with showing the actual & equivalent rectangular stress distribution of ultimate load.
- 13.3 State the load and load factors used in USD method.
- 13.4 Mention the notations used in flexure formula in USD method.
- 13.5 Express the derivation of the flexure formula in USD method.
- 13.6 Solve problems of flexure formula based on USD method.

14 Understand the design of RCC rectangular beam in USD method.

- 14.1 Outline the design steps of RCC rectangular beam in USD method.
- 14.2 Design a simply supported RCC rectangular beam in USD method.
- 14.3 Design a semi-continuous RCC rectangular beam in USD method.
- 14.4 Design a continuous RCC rectangular beam in USD method.

15 Understand the design of RCC cantilever & overhanging rectangular beams in WSD method.

- 15.1 Determine the design load, shear force and bending moment of RCC cantilever & overhanging beams.
- 15.2 Design a cantilever RCC rectangular beam.
- 15.3 Design an overhanging RCC rectangular beam.
- 15.4 Describe the technique of curtailment of reinforcement in cantilever RCC beams.

16 Understand the T-beam and its uses.

- 16.1 Define T-beam.
- 16.2 Identify the different parts of a typical T-beam.
- 16.3 Determine the width of flange of T-beam considering span length and slab thickness.
- 16.4 State the ratio of width of web to the depth of web for T-beams.
- 16.5 Distinguish between RCC rectangular beam and T-beam.

17 Understand the design of RCC T-beams.

- 17.1 Determine the depth and width of a simply supported T-beam in respect to shear force.
- 17.2 Outline the design steps of RCC T-beam in WSD method.
- 17.3 Design a simply supported RCC T-beam in WSD method.
- 17.4 Design a semi-continuous RCC T-beam in WSD method.
- 17.5 Design a continuous RCC T-beam in WSD method.

18 Understand the design of RCC beam with compression reinforcement.

- 18.1 State the meaning of double reinforced beam.
- 18.2 Differentiate between RCC single and double reinforced beam.
- 18.3 Outline the design steps of double reinforced beam.

- 18.4 Design a simply supported double reinforced beam.
- 18.5 Design a semi-continuous double reinforced beam.
- 18.6 Design a continuous double reinforced beam.

19 Understand the design of RCC lintel over doors & windows.

- 19.1 Determine the area of the wall to be considered in determining the design load for RCC lintels.
- 19.2 Outline the design steps of RCC lintel.
- 19.3 Design a RCC lintel over doors and windows.

Practical:

- 1. Conduct compression test of concrete for particular proportion with different water-cement ratio.**
 - 1.1 Mix concrete with different water-cement ratio.
 - 1.2 Fill in the mould (cylinder and cube).
 - 1.3 Keep cylinder and cube in the water for curing.
 - 1.4 Test the specimen in the compression test machine.
 - 1.5 Take the readings and tabulate in the form (test report).
 - 1.6 Calculate the ultimate and allowable compressive strength of concrete.
- 2. Conduct tensile strength test of mild steel for both plain bar and deformed bar of different diameters.**
- 3. Prepare a model of simply supported RCC rectangular beam as per drawing.**
- 4. Prepare a model of semi-continuous RCC rectangular beam as per drawing.**
- 5. Prepare a model of continuous RCC rectangular beam as per drawing.**
- 6. Prepare a model of double reinforced simply supported rectangular beam as per drawing.**
- 7. Prepare a model of RCC lintel as per drawing.**
- 8. Prepare a model of RCC lintel with sunshade as per drawing.**

REFERENCE BOOKS

1. Simplified Design of Reinforced Concrete
-by H Parker
2. Design of Concrete Structures
-by G Winter, L C Urquhart, C E O'Rourke, A H Nilson
3. Treasure of R C C Designs
-by Sushil Kumar
4. R C C Design
-by Abul Faraz Khan

5853

ENTREPRENEURSHIP

T P C
2 0 2**AIMS**

- To be able to understand the concept of entrepreneurship & entrepreneur.
- To be able to understand the concept of environment for entrepreneurship.
- To be able to understand the sources of venture ideas in Bangladesh.
- To be able to understand the project selection.
- To be able to understand business planning.
- To be able to understand the case study

SHORT DESCRIPTION

Concepts of entrepreneurship & entrepreneur; Entrepreneurship & economic development; Environment for entrepreneurship; Entrepreneurship in the theories of economic growth; Sources of ventures ideas in Bangladesh; Evaluation of venture ideas; Financial planning; Project selection; Self employment; Entrepreneurial motivation; Business plan; Sources of assistance & industrial sanctioning procedure.

Insurance ; case study.

DETAIL DESCRIPTION**Theory :****1 Understand the basic concept of entrepreneurship & entrepreneur.**

- 1.1 Define entrepreneurship & entrepreneur.
- 1.2 Discuss the characteristics and qualities of entrepreneur.
- 1.3 Mention the classification of entrepreneur.
- 1.4 Discuss the case entrepreneurship and mass entrepreneurship.
- 1.5 Discuss the necessity of entrepreneurship as a career.
- 1.6 Discuss the function of entrepreneur in developing countries.
- 1.7 Discuss the prospect of entrepreneurship development in Bangladesh.

2 Understand the concept of entrepreneurship and economic development.

- 2.1 Define economic development.
- 2.2 Discuss that the economic development is a process.
- 2.3 Describe the entrepreneurship as a factor of economic development.
- 2.4 Discuss the capital accumulation or rate of savings.
- 2.5 Discuss the role of entrepreneur in the technological development and their introduction into production Process.
- 2.6 Discuss the entrepreneur in the discovery of new sources of resources.
- 2.7 Discuss the entrepreneur in the discovery of new product.
- 2.8 Discuss the discovery of new markets.

3 Understand the concept of entrepreneurship in the theories of economic growth.

- 3.1 Define entrepreneurship in the theories of economic growth.
- 3.2 Discuss the theory of need for achievement of Devid MacClelland.
- 3.3 Discuss the Malthusian theory of population and economic growth.
- 3.4 Discuss the labour theory of production and limit to growth.
- 3.5 Discuss the Keynesian theory of employment and output.
- 3.6 Discuss the stage theory of growth.
- 3.7 Discuss the Schumpeterian theory of economic development.
- 3.8 Discuss the entrepreneurship motive in economic development.

4 Understand the sources of vantage ideas in Bangladesh.

- 4.1 Define sources of venture ideas in Bangladesh.
- 4.2 Discuss different types of sources of venture ideas in Bangladesh.
- 4.3 Discuss informal sources of venture ideas in Bangladesh.

5 Understand the evaluation of venture ideas.

- 5.1 Define evaluation of venture ideas.
- 5.2 Discuss the factors that influence the selection of venture ideas.
- 5.3 Discuss the evaluating financial aspects of business.
- 5.4 Discuss the determinants of the firm size.

6 Understand the concept of project selection and financial planning.

- 6.1 Define project.
- 6.2 Discuss the idea of project.
- 6.3 Describe the guide lines for project ideas.
- 6.4 Discuss the sources of project ideas.
- 6.5 Discuss the evaluation of project ideas.
- 6.6 Describe the technical aspect of project.
- 6.7 Define financial planning.
- 6.8 Discuss the long term financial plan.
- 6.9 Discuss the short term financial plan.

7 Understand the concept of self employment.

- 7.1 Define self employment.
- 7.2 Describe different types of employment.
- 7.3 Describe the importance of business as a profession.
- 7.4 Discuss the reasons for success and failure in business.
- 7.5 Discuss the self assessment of entrepreneurial qualities.

8 Understand the concept of entrepreneurial motivation.

- 8.1 Define entrepreneurial motivation.
- 8.2 Discuss the achievement motivation theory.
- 8.3 Describe the means of improving achievement motivation.
- 8.4 Discuss the background of high need achievement.
- 8.5 Describe the problems associated with high need achievement.

9 Understand the business plan and the concept of the environment for entrepreneurship.

- 9.1 Define business plan.
- 9.2 Describe the importance of business plan.
- 9.3 Discuss the contents of business plan.
- 9.4 Describe the business plan proforma.
- 9.5 Define environment of business.
- 9.6 Describe the factors which effect environment on entrepreneurship
- 9.7 Discuss the aspects of business environment

10 Understand the concept of sources of assistance & industrial sanctioning procedure.

- 10.1 Define sources of assistance.
- 10.2 Describe different types of sources of assistance.
- 10.3 Describe entrepreneurship development cycle.
- 10.4 Discuss the aid of sources.
- 10.5 Discuss the industrial policy.
- 10.6 Describe the technique of industrial policy.
- 10.7 Define foreign aid.

11 Understand the insurance and premium.

- 11.1 Define insurance and premium
- 11.2 Describe the essential conditions of insurance contract.

11.3 Discuss various types of insurance.

11.4 Distinguish between life insurance and general insurance.

12 Understand the concept of case studies.

12.1 Define case study.

12.2 Discuss the objectives of case study.

12.3 Describe the method of case analysis.

12.4 Discuss the importance of case study.

12.5 Mention the advantages and disadvantages of case study