



**BANGLADESH TECHNICAL EDUCATION BOARD**  
Agargaon, Dhaka-1207.

4-YEAR DIPLOMA-IN-ENGINEERING PROGRAM  
SYLLABUS (PROBIDHAN-2016)

# **ARCHITECTURE TECHNOLOGY**

TECHNOLOGY CODE: **661**

7th SEMESTER

DIPLOMA IN ENGINEERING  
PROBIDHAN-2016

**ARCHITECTURE TECHNOLOGY (661)**

**7<sup>th</sup> SEMESTER**

Sl. No	Subject Code	Name of the subject	T	P	C	Marks				Total
						Theory		Practical		
						Cont. assess	Final exam	Cont. assess	Final exam	
1	66171	Architectural Project	0	9	3	0	0	75	75	150
2	66172	Professional Practice	3	0	3	60	90	0	0	150
3	66173	Interior Design-2	2	6	4	40	60	50	50	200
4	66174	Urban Planning	2	3	3	40	60	25	25	150
5	66175	Computer Rendering & Animation -2	0	6	2	0	0	50	50	100
6	66463	Design of structure -1	2	3	3	40	60	25	25	150
7	65853	Innovation & Entrepreneurship	2	0	2	40	60	0	0	100
Total			11	27	20	220	330	225	225	1000

**AIMS**

To be able to understand

- the Individual building
- related drawings
- operate an individual building project
- represent a building project as a coordinator

**SHORT DESCRIPTION**

Site Analysis; Preliminary Sketch; Final Sketch; Approval Sheet; Working Drawing; Finishing Schedule; Utility Services; Cost Estimate; Perspective Drawing; Model; & Brochure.

**DETAIL DESCRIPTION****PRACTICAL**

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

- A brochure containing all necessary drawings, photographs of model of the project, detail estimated cost of the project,
- A detail model of the project.

**PROJECT:**

Duplex House/ Split Level House/ Multi Storied Apartment House

**1. Accomplish preliminary site investigation and analysis.**

- 1.1 Make the site inventory and resource analysis.
- 1.2 List the considerations of the site.
- 1.3 Make the topographical survey of the site
- 1.4 Make soil investigation of the site.
- 1.5 Select a foundation type needed for the site from the above investigation.

**2 Bring out the factors affecting building location and orientation.**

- 2.1 Draw the sun path diagram.
- 2.2 Draw the prevailing wind orientation.
- 2.3 Categorize the local climatic condition.
- 2.4 Sketch the noise propagation surrounding the site.
- 2.5 Draw the landscape elements of the site.

**3. Prepare preliminary sketch of the project.**

- 3.1 Draw the site in 1:100 (1/8"=1'-0") scale.
- 3.2 Draw bubble diagram of the project.
- 3.3 Sketch line diagram of the ground floor maintaining building-by-laws for approval of client.
- 3.4 Sketch line diagram of the 1st/typical floor maintaining building-by-laws.
- 3.5 Sketch the elevation/ free hand perspective view of the project.

**4. Prepare presentation drawing of the project.**

- 4.1 Draw the site plan in 1:400 or 1:200 scale (1/32"=1'-0 or 1/16"=1'-0)
- 4.2 Draw the floor plans with furniture arrangement and rendering, scale 1:100 (1/8"=1'-0").
- 4.3 Draw the front elevation with rendering, scale 1:100 (1/8"=1'-0").
- 4.4 Make a mass model of the project building, scale 1:100 (1/8"=1'-0").
- 4.5 Make a brief description of the project with rough estimated cost.
- 4.6 Make a brochure with above topics (4:1 to 4:5) for approval of the client/owner.

**5. Prepare approval sheet of the project.**

- 5.1 Make a list of necessary drawings of the approval.
- 5.2 Make a list of necessary papers/documents for the approval of building.
- 5.3 Draw the approval sheet for the local authority (as RAJUK, CDA, KDA, RDA, SDA, Pourashava, City corporation etc.).

- 5.4 Make several copies (ammonia/computer print) of the approval sheet.
- 5.5 Fill up the necessary forms for approval the local authority.

## **6. Prepare working drawings of the project.**

- 6.1 Draw ground floor plan with detail dimensions in 1:50 ( $\frac{1}{4}''=1'-0''$ ) scale.
- 6.2 Draw 1st/typical floor plan with detail dimensions, scale 1:50 ( $\frac{1}{4}''=1'-0''$ ).
- 6.3 Draw the roof plan showing rain water drainage system with detail dimensions in 1:50 ( $\frac{1}{4}''=1'-0''$ ) scale.
- 6.4 Draw elevations of the building showing materials, scale 1:50 ( $\frac{1}{4}''=1'-0''$ ).
- 6.5 Draw the long section of the building through staircase with detail dimensions, scale 1:50 ( $\frac{1}{4}''=1'-0''$ ).
- 6.6 Draw the cross section of the building with detail dimensions, scale 1:50 ( $\frac{1}{4}''=1'-0''$ ).
- 6.7 Draw necessary part sections (through verandah, sunshade etc.) with detail dimensions, scale 1:50 ( $\frac{1}{4}''=1'-0''$ ).

## **7. Prepare detail drawings of the toilet.**

- 7.1 Draw the detail plan of the different toilets of the project showing different fixtures used in toilet with detail dimensions and also showing plumbing lines in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 7.2 Draw the necessary sections showing maximum fixtures, cabinet (if any) with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 7.3 Make a finishing schedule of the toilet.

## **8. Prepare detail drawings of the kitchen.**

- 8.1 Draw the detail kitchen plan of the project showing different fixtures/areas used in kitchen with detail dimensions and showing plumbing lines in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 8.2 Draw the necessary sectional elevation showing maximum fixtures, cabinet and over head cabinet with detail dimensions in scale 1:25 ( $\frac{1}{2}''=1'-0''$ ).
- 8.3 Make a finishing schedule of the kitchen.

## **9. Prepare detail drawings of the stair.**

- 9.1 Draw the detail plan of the stair with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 9.2 Draw the detail sections with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 9.3 Draw the section of the steps with nosing in 1:10 ( $1''=1'-0''$ ) scale.
- 9.4 Draw the railing section and hand rail in 1:10 ( $1''=1'-0''$ ) scale.
- 9.5 Draw the fixing arrangement of baluster in 1:10 ( $1''=1'-0''$ ) scale.

## **10. Prepare schedule of the project.**

- 10.1 Make a finish schedule of the project.
- 10.2 Make door and window schedule of the project.
- 10.3 Arrange a CPM for the project.
- 10.4 Make a bar chart of the project
- 10.5 Estimate the detail cost /prepare the detail cost estimate of the project.

## **11. Prepare detail drawings of the door.**

- 11.1 Draw the detail plan of the door used in the project with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 11.2 Draw the detail elevation in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 11.3 Draw the vertical section of the door with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 11.4 Draw the necessary details (at least three) of the door in 1:10 ( $1''=1'-0''$ ) scale.
- 11.5 Draw different fixing arrangement of the doors.

## **12. Prepare detail drawing of the window.**

- 12.1 Draw the detail plan of the window used in the project with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 12.2 Draw the detail elevation in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 12.3 Draw the vertical section of the window with detail dimensions in 1:25 ( $\frac{1}{2}''=1'-0''$ ) scale.
- 12.4 Draw the necessary details of the window in 1:10 ( $1''=1'-0''$ ).
- 12.5 Draw different fixing arrangements of the windows.

## **13. Prepare detail drawings of the utility services.**

- 13.1 Draw the site plan of the project in 1:100 ( $\frac{1}{8}''=1'-0''$ ) scale.
- 13.2 Draw the rain water disposal system of the site.
- 13.3 Draw the plumbing and sanitary system of the project.

- 13.4 Draw the detail drawing of the Septic Tank (ST) and Soak Well (SW).
- 13.5 Draw detail drawings of underground water reservoir.
- 13.6 Draw detail drawings of overhead water reservoir.

#### **14. Prepare perspective drawings and model.**

- 14.1 Draw a two point exterior perspective of the building/3D exterior (using computer software) of the building.
- 14.2 Draw the interior perspective of the living room/bed room/double height space (if any).
- 14.3 Draw an interior perspective of the bath/hand wash.
- 14.4 Draw an interior perspective of the kitchen.
- 14.5 Draw an interior perspective of the internal stair (for duplex).
- 14.6 Draw an interior perspective of the entrance/lobby/foyer.
- 14.7 Make a final detail model of the project in 1:100 ( $\frac{1}{8}''=1'-0''$ ) or ( $\frac{3}{16}''=1'-0''$ ) scale showing detail landscape and surroundings.

#### **15. Prepare structural drawings of the project.**

- 15.1 Draw the layout plan of the project.
- 15.2 Draw the foundation/footing/trench plan and section with detail dimensions.
- 15.3 Draw the reinforcement detail of column footing with dimensions and necessary information.
- 15.4 Draw the reinforcement detail of grade beams and other floor beams with dimensions and necessary information.
- 15.5 Draw the reinforcement detail of floor slab and roof slab with dimensions and necessary information.
- 15.6 Draw the reinforcement detail of stair with dimensions and necessary information.
- 15.7 Draw the reinforcement detail of underground and overhead water reservoir with dimensions and necessary information.
- 15.8 Draw the reinforcement detail of sunshade, railing, drop wall, lintel etc. with detail dimensions and necessary information.

#### **16. Prepare electrical drawings of the project.**

- 16.1 Draw the electrical fixture and conduit layout of different floors.
- 16.2 Make the chart with abbreviation and symbol of the electric layout.
- 16.3 Draw the necessary circuit diagrams.
- 16.4 Show the earthing and lightning arrester system of the project.

#### **REFERENCE:**

Architectural Drafting and Design

By Donald E Hepler

Paul L Wallach

Time saver standard for building type

By Joseph D Chira

Time saver standard for site planning

By Joseph D Chira

New Metric Hand Book

By Tutt/Adler

**AIMS**

To be able to understand

- Architectural Professional.
- the role of Diploma Architect.
- importance of site visit.
- the controlling authority in Architectural field.
- Organizational set- up of Architectural firm.
- building By-laws of GOB.
- BNBC.

**SHORT DESCRIPTION**

Architectural Profession; Role of a diploma architect in building industry; Importance of site visit; controlling authority; Organizational set- up; Building By-laws, BNBC & Architect profession.

**DETAIL DESCRIPTION:****THEORY****1. Understand the Architectural Profession and organizational set-up.**

- 1.1 State the Architectural profession.
- 1.2 Define Architectural consulting firm.
- 1.3 Describe about organizational chart of Architectural consulting firm.
- 1.4 State professional Laws & ethics of Architecture.
- 1.5 Explain the role & responsibilities of a diploma Architect in developing an Architectural design.
- 1.6 State the relationship between a graduate Architect and a diploma Architect.
- 1.7 State the relationship between employees and professionals.
- 1.8 Describe the fees of Architects/ Architectural firm.

**2. Understand the importance of site visit.**

- 2.1 State site visit.
- 2.2 List the important features of site visit.
- 2.3 Discuss the importance of site visit.
- 2.4 State the stages of site visit by designers.
- 2.5 State the role of designers.
- 2.6 State shop drawing & as built drawing.

**3. Understand the controlling authority.**

- 3.1 List & define the controlling authority.
- 3.2 Describe about IAB, IEB & IDEB.
- 3.3 Describe different authorities for giving permission of building construction. (RAJUK, CDA, RDA, BDA, SDA, KDA, City Corporation, Pourashava, Union perished etc.)
- 3.4 Describe the membership procedure of IAB, IEB & IDEB.
- 3.5 Describe the laws of fire services, civil Aviation authority, Paribesh Adhidaptar & other authorities for the approval of building/ structure.

#### **4. Understand the building By-laws & BNBC.**

- 4.1 State briefly building by-laws.
- 4.2 Discuss the essential points in building by-laws.
- 4.3 Define FAR and calculation of FAR.
- 4.4 Discuss MGC and calculation of MGC.
- 4.5 Describe set-back procedure.
- 4.6 Discuss the fire exit allowance.
- 4.7 Describe the garage/parking space.
- 4.8 Describe NBC & BNBC.

#### **5. Understand different terms for practice of Architect profession.**

- 5.1 Define owner, consultant and client.
- 5.2 Distinguish earnest money and security money.
- 5.3 Differentiate between the schedule amount and contract money.
- 5.4 Describe running account bill and Bill of Qualities (BOQ).
- 5.5 Describe Force Majeure.
- 5.6 Describe maintenance period and certificate of payment.

#### **6. Understand the public works accounts.**

- 6.1 State the Public Works Department (PWD).
- 6.2 Discuss the organization of engineering department.
- 6.3 Describe the accounts & system of PWD accounts. Define the terms- Cash, Receipts of money, Treasury Challan, Revenue receipts, Payments, Cash book, Subsidiary cash book, Suspense accounts, Temporary Advance.
- 6.4 Discuss the payment to suppliers and contractors.
- 6.5 Differentiate the bills and vouchers.
- 6.6 Discuss payment on account, running account and closing of works accounts.
- 6.7 Discuss the financial aid to contractor.
- 6.8 Describe the schedule of rates.

#### **7. Understand the Contracts & public procurement rules of Bangladesh.**

- 7.1 Define contract
- 7.2 Describe the contractors and their qualifications.
- 7.3 List the different types of engineering contract.
- 7.4 Describe the advantages and disadvantages of engineering contract.
- 7.5 Explain the condition of contracts.
- 7.6 Define the Public procurement rule (PPR).
- 7.7 Explain different rules for procurement.
- 7.8 State the meaning of the following PPR, ITT, TDS, GCC, PCC, STD, NOA, BOQ, TOC, HOPE, CS etc.

#### **8. Understand the tender.**

- 8.1 Define tender, tender form, tender documents, tender notice and tender schedule.
- 8.2 Describe the time limits for tender notice and sale of tender documents.
- 8.3 Describe the submission process of tender and deposit of earnest money.
- 8.4 Describe the rules of tender opening.

- 8.5 Discuss the Comparative statement (CS) of tenders.
- 8.6 Write a tender notice to circulate at newspaper.
- 8.7 Define the terms: formal tender, informal tender, unbalanced tender, acceptance of tender, work order, contract documents, retention money, liquidated damage, unliquidated damage, compensation for delay in completion.

#### **9. Understand writing up measurement books (MB)**

- 9.1 Define the importance and issue of measurement book.
- 9.2 Describe the instructions in recording measurement & measurement of inadmissible items.
- 9.3 Explain the method of recording nomenclature of items.
- 9.4 Describe the test checking of measurement and dispute over measurement.
- 9.5 Describe writing of measurement book.
- 9.6 Discuss the contractor's bill and compare it with the MB.

#### **10. Understand the Project Estimate.**

- 10.1 Define rate analysis and estimating.
- 10.2 Discuss the estimating of quantity of materials.
- 10.3 Discuss the method of measurement of works.
- 10.4 Describe the project estimate.
- 10.5 Describe CPM, PERT and Bar Chart.

#### **11. Understand the Specification.**

- 11.1 Define specification.
- 11.2 Discuss the necessity of specification.
- 11.3 Describe the types of specification.
- 11.4 Describe the standard specification, special specification and general specification.
- 11.5 Discuss the advantages and disadvantages of different specification.
- 11.6 Describe about specification writing- on general specification and special specification of project works.
- 11.7 Show rate analysis of some common items. (CC work, Mass RCC work in structure, brick work, wooden doors and windows, aluminum doors and windows, tiles work, stone work, mosaic work, wood paneling, plastering, distempering, weather coat, varnishing on wooden surface etc.)

#### **12. Understand the Arbitration.**

- 12.1 Define arbitration and arbitrator.
- 12.2 Discuss the arbitration act.
- 12.3 Describe the arbitration agreement.
- 12.4 Describe the powers and qualifications of arbitrator.
- 12.5 Describe the different types of arbitration.

#### **13. Understand the Valuation.**

- 13.1 Define valuation.
- 13.2 Differentiate between valuation and cost.
- 13.3 Discuss the purpose of valuation.

- 13.4 Explain the terms: Gross income, Outgoings, Net income, Scrap value, Assessed value, Replacement value, Potential value, Monopoly value, Sentimental value, Accommodation value, Sinking fund, Capitalized value, & Reversionary Value.
- 13.5 Explain the basis of valuation for the purpose of mortgage.

#### **14. Understand the related local authorities.**

- 14.1 Define the local authority of Bangladesh.
- 14.2 Discuss the function of local authorities.
- 14.3 List the name of local authorities.
- 14.4 Explain LGRD, LGED, WASA, TITAS Gas, DNCC and DSCC.
- 14.5 Explain City Corporation and Pourashava.
- 14.6 Describe the electric supply authority (i.e. PDB, REB, DESA, DESCO, PGCB, etc.).

#### **REFERENCE BOOKS**

1. Architectural Practice

By Clinton H. Cowgill, A.I.A. & Ben John Small

২. বাংলাদেশ গেজেট (গনপূর্ত), ২২ জুন ২০১০

3. Bangladesh National Building Code (BNBC).

## AIMS

Students will be able to understand the-

- air conditioning system of an office/bank,
- building acoustics ,
- interior furniture,
- fire protection system of building.
- painting and wall paper, ceiling and floor covering.
- function of draperies, slip covers and wall composition.

## SHORT DESCRIPTION

Room orientation, air conditioning, lighting system and building acoustics, furniture, fire fighting system, painting and wall paper, ceiling and floor covering, function of draperies, slip covers and wall composition, interior design of a bank or a studio office.

## DETAIL DESCRIPTION

### 1.0 Understand the effects of room orientation on interior design.

- 1.1 State interior design.
- 1.2 Define various interior spaces.
- 1.3 Explain the climatic consideration of interior design.
- 1.4 Explain internal temperature and effect of orientation on internal temperature.
- 1.5 Explain the effect of door and window orientation on internal temperature.
- 1.6 Explain the effect of orientation and ventilation.

### 2.0 Understand the requirements of air conditioning in building.

- 2.1 Define Air conditioning, BTU, condensate, conductance, conductivity, convection, Enthalpy Heat transmission coefficient, Humidity, Psychometrics.
- 2.2 Define comfort.
- 2.3 Understand the effective temperature.
- 2.4 Describe the necessity of air conditioning in building.
- 2.5 Name different elements of an air conditioning unit suitable for use in all weather.
- 2.6 Name the factors to be considered in designing air conditions in a bed room.  
Explain the heat load and cooling load of a building.

### 3.0 Understand the fundamentals of Architectural Acoustics.

- 3.1 Define sound propagation, frequency, velocity and wavelength.
- 3.2 Define sound reflection, absorption and transmission.
- 3.3 Discuss reverberation and reverberation time.
- 3.4 Explain behavior of sound in enclosed spaces.
- 3.5 Mention acoustical properties of building materials and special acoustical materials.
- 3.6 Explain scope of acoustical problems.

### 4.0 Understand the room acoustics.

- 4.1 Describe the room volume for acoustics.
- 4.2 Describe the room shaping for acoustics.
- 4.3 Discuss the necessary characteristics of a reflective panel; perforated absorptive panel.
- 4.4 Explain of room shaping and reverberation.

## **5.0 Understand Noise control.**

- 5.1 Describe means of noise control.
- 5.2 Explain distance and screening for noise control.
- 5.3 Discuss the noise protection planning of the building.
- 5.4 Explain noise control requirement.
- 5.5 Explain ventilators for noise absorption & ventilator.

## **6.0 Understand the furniture of interiors, molding patterns & fasteners of furniture.**

- 6.1 Define formal and informal style of furniture.
- 6.2 Describe the major styles (traditional, provincial and contemporary style) of furniture.
- 6.3 Discuss the fundamentals and principles of design for furniture.
- 6.4 Mention the steps in furniture design and common error in design.
- 6.5 Describe the scientific and artistic qualities of furniture.
- 6.6 Describe the criteria for selection of materials and color for furniture.
- 6.7 List the common molding pattern in interiors and their uses.
- 6.8 Define the fasteners of furniture and compare between them (nails & screw).
- 6.9 List the different finishing system of furniture or wooden works.
- 6.10 Describe the procedural steps of general finishing system for porous & nonporous wooden furniture.

## **7.0 Understand the fire protection system of building.**

- 7.1 Define fire protection system in building.
- 7.2 Discuss about sprinkler and standpipe systems.
- 7.3 Fire protection systems using fogs and chemicals
- 7.4 Describe fire protection.
- 7.5 Explain -
  - 7.5.1 preventive measures,
  - 7.5.2 fire resisting
  - 7.5.3 construction

## **8.0 Understand the painting and the role of wall paper in interior decoration.**

- 8.1 Discuss ingredients and types of paints.
- 8.2 Explain the painting process.
- 8.3 Explain common painting defects and remedies.
- 8.4 Describe the historical development of wall paper.
- 8.5 Describe the various types of wall paper and their uses.

## **9.0 Understand the role of ceiling and floor covering in interior decoration.**

- 9.1 Describe the historical development of ceiling and floor covering.
- 9.2 List the various name of ceiling and false ceiling materials.
- 9.3 Describe the uses of the ceiling/false ceiling materials.
- 9.4 List the various name of floor covering materials.
- 9.5 Describe the uses of the floor covering materials.

## **10.0 Understand the function of draperies and slip covers.**

- 10.1 State the classification of window draperies.
- 10.2 Describe the point to be considered for drapery design.
- 10.3 Describe the term "Valance" for drapery supports.
- 10.4 Discuss the selection of drapery materials.
- 10.5 Describe the function of trimming for the curtain.
- 10.6 Mention the use of slipcovers.
- 10.7 State the types of blinds and their uses.

### **11.0 Understand the wall composition.**

- 11.1 Describe the problems of composition in the treatment of interior.
- 11.2 Describe the principles of wall design.
- 11.3 Describe the horizontal division of wall composition.
- 11.4 Describe the vertical division of wall composition.
- 11.5 Describe the contrast of vertical and horizontal lines and straight and curved lines.
- 11.6 Describe the contrast of light and dark colors.

### **PRACTICAL**

Each student has to submit the following things of any one of the given projects (Bank/Studio Office):

- A brochure containing all necessary drawings, photographs, detail estimated cost, and a detail model of the project. (**PROJECT: Interior Design of a BANK or a STUDIO OFFICE**)

#### **1. Perform the drawing of a Studio Office. (Size: 400- 500 SFT/100 SQM-150 SQM)**

- 1.1 Visit a site and collect necessary measurement.
- 1.2 Prepare as built drawing of a given bank or office space.
- 1.3 Take necessary picture of the site.
- 1.4 Make a SWOT analysis for the given project.

#### **2. Prepare preliminary sketch of the project.**

- 2.1 Sketch line diagram of the floor plan of Bank/Studio office for approval of client.
- 2.2 Sketch the furniture layout of the Bank/Studio office.
- 2.3 Sketch the elevation/ free hand perspective view of the interior of given project.
- 2.4 Sketch the floor showing the detail of covering materials.
- 2.5 Sketch the ceiling showing the detail of materials.

#### **3. Prepare presentation drawing of the project.**

- 3.1 Draw the plan in a suitable scale.
- 3.2 Draw the floor plans with furniture arrangement and rendering in a suitable scale.
- 3.3 Draw the front elevation with rendering in a suitable scale.
- 3.4 Make a mass model of the project building in a suitable scale.
- 3.5 Make a brief description of the project with rough estimated cost.
- 3.6 Make a presentation of the project.

#### **4. Prepare working drawings of the project.**

- 4.1 Draw floor plan with detail dimensions.
- 4.2 Draw the detail of different furniture.
- 4.3 Draw the ceiling plan showing materials and detail dimensions.
- 4.4 Draw the detail of walls (Wood/ Board/PVC/ACP/Glass/Paint/Varnish/Wallpaper/Tiles/ Artificial Grass /wall paneling/ bone-tile, or any other wall treatment).
- 4.5 Draw the necessary detail section with detail dimensions.

#### **5. Prepare perspective drawings and model.**

- 5.1 Draw an interior perspective of the Bank/Studio office.
- 5.2 Draw the perspective view of the work station.
- 5.3 Draw perspective view of Reception/lobby.
- 5.4 Draw perspective view of the furniture.
- 5.5 Make the model of furniture.
- 5.5 Make a final detail model of the project showing furniture.

## **6. Prepare electrical drawings of the project.**

- 6.1 Draw the electrical fixture and conduit layout of the of the Bank/Studio office.
- 6.2 Make the chart with abbreviation and symbol of the electric layout.
- 6.3 Draw the necessary circuit diagrams.

## **7. Prepare schedule of the interior project.**

- 7.1 Make a finish schedule of the Bank/Studio office.
- 7.2 Make door and window schedule of the project.
- 7.3 Make a schedule of the electrical materials of the project.
- 7.4 Estimate the detail cost /prepare the detail cost estimate of the project.

Ref:

1. Environmental Technologies in Architecture, Kinzey and sharp
2. Architecture Drafting and design, Paul I wallach.
3. Manual of Tropical Housing and Building
  - O.H. Koenigs berger.
  - T.G. Ingersoll
  - Alan Mayhew
  - S.V. Szokolay
4. Man, climate and Architecture (2<sup>nd</sup> Edition) -- B. Givoni
5. এনভায়রনমেন্টাল ডিজাইন (বাংলাদেশ কারিগরি শিক্ষা বোর্ড)  
(মোঃ রফিকুল ইসলাম মীর।

## AIMS

To be able to understand

- the basic concepts of town planning.
- the process of town development.
- zoning of town.
- the growth of town.
- slums, squatters.
- road systems & traffic control.
- the master plan of a town.

## SHORT DESCRIPTION

Principles of town planning and its characteristics; Growth of town; Elements of city plan & surveying; Zoning system; Housing, Neighborhood unit and garden city; Slum & Squatter; Parks & Play grounds; Industries of a town; Systems of road communications, traffic control; Master plan.

## DETAIL DESCRIPTION

### Theory:

#### **1 Understand the principles of town planning and its characteristics.**

- 1.1 Define planning & necessity of planning.
- 1.2 Define Planning age, town & town planning.
- 1.3 Explain the aims of town planning.
- 1.4 State principles of town planning.
- 1.5 Describe necessity of town planning.
- 1.6 State the work and main features of famous town planners.
  - 1.6.1 Sir Patrick Geddes.
  - 1.6.2 Sir Ebenezer Howard.
  - 1.6.3 Le Corbusier.
- 1.7 Define Individuality of town & forms of planning.

#### **2 Understand the growth of town.**

- 2.1 Define origin of town.
- 2.2 List the types of towns with definition.
- 2.3 State the stages in the growth of towns.
- 2.4 State the methods of external growth with details.
- 2.5 Explain the advantages & disadvantages of different external growth.
- 2.6 Explain the causes of expansion of towns.
- 2.7 State green belt of a town/city.

#### **3 Understand the elements of city plan and surveying.**

- 3.1 Define the elements of city plan.
- 3.2 List the elements of city plan.
- 3.3 Explain distribution of land.
- 3.4 Describe aesthetics of town planning with different measures.
- 3.5 Define necessity of surveying.
- 3.6 Explain different types of surveying used for town planning.

**4 Understand the zoning system.**

- 4.1 Define zoning.
- 4.2 Describe the purposes & importance of zoning.
- 4.3 Describe different zoning (use zoning & its types, height & density zoning) in modern town.
- 4.4 Calculate the maximum height for height zoning.
- 4.5 Discuss the net & gross density of a town.
- 4.6 Discuss advantages and disadvantages of zoning.
- 4.7 Discuss about zoning powers.

**5 Understand Housing, Neighborhood unit and Garden city.**

- 5.1 Define housing.
- 5.2 State the classification of housing.
- 5.3 State neighborhood unit.
- 5.4 Explain the principles of neighborhood planning.
- 5.5 State garden city.
- 5.6 Explain the advantages and disadvantages of garden city.
- 5.7 Make a presentation with a case study on Singapore as garden city.

**6 Understand the slum & squatter.**

- 6.1 Define slum & squatter.
- 6.2 Describe difference between slum and squatter.
- 6.3 List the causes of slums.
- 6.4 State the effects of slums on town life.
- 6.5 Define the precautions to be taken against formation of slums.
- 6.6 Describe the process of slum clearance.
- 6.7 Make a presentation with a case study on Hong Kong from slum to a modern city.

**7 Understand parks and play grounds of a town.**

- 7.1 Define the recreational facilities.
- 7.2 Describe necessity of recreational facilities.
- 7.3 State features of public recreational systems.
- 7.4 Describe selection of sites for parks and playfields.
- 7.5 State types of recreational systems.
- 7.6 Describe various forms of recreational amenities.
- 7.7 Describe park systems.
- 7.8 Discuss standards of open spaces.

**8 Understand the industries of a town.**

- 8.1 State the necessity of industries.
- 8.2 Describe the classification of industries.
- 8.3 Discuss the selections of sites for industries.
- 8.4 Describe industrial waste .
- 8.5 Discuss the effects of industrial waste.
- 8.6 Describe the treatments of industrial waste.

**9 Understand the systems of road communications.**

- 9.1 State road and road communications.
- 9.2 Describe the requirements of ideal city roads and aesthetics.
- 9.3 Describe the classification of roads.
- 9.4 Describe the types of road systems.
- 9.5 Describe right of way and different road kerbs.
- 9.6 Describe different types of road junctions & crossings.

- 10 Understand the systems of traffic control.**
- 10.1 Define traffic management.
  - 10.2 Describe traffic congestion in cities.
  - 10.3 Describe disadvantages of traffic congestions.
  - 10.4 Describe remedies of traffic congestions.
  - 10.5 Define traffic control.
  - 10.6 State different control devices (Traffic signs & signals).
- 11 Understand master plan.**
- 11.1 State master plan.
  - 11.2 Explain the objects of master plan.
  - 11.3 Describe the necessity of master plan.
  - 11.4 Identify different steps to be followed for preparation of master plan.
  - 11.5 Describe the data to be collected for preparing of master plan.
  - 11.6 Describe the procedure to prepare a map for master plan
  - 11.7 Describe the implementation of master plan.

**Practical:**

- 1 Prepare a set of drawing of zoning of a town.**
- 1.1 Draw a site of a town and distribute the land in different zone.
  - 1.2 Draw the figures to show the laws of height zoning.
  - 1.3 Draw the plan of a density zoning.
  - 1.4 Draw the plan of a use zoning.
  - 1.5 Draw a graph or chart to show the land distribution of a town.
- 2 Prepare a set of drawing of housing, neighbourhood unit, garden city & growth of town**
- 2.1 Draw different types of housing.
  - 2.2 Draw a neighbourhood unit.
  - 2.3 Draw a plan of a garden city (partial).
  - 2.4 Draw the locations of satellite town in respect of a town/city.
  - 2.5 Draw a plan of scattered growth.
  - 2.6 Draw a plan of ribbon development.
  - 2.7 Draw a plan of planned growth of a town.
  - 2.8 Draw a plan of Reill & Radburn.
- 3 Prepare a set of drawings of parks & play ground.**
- 3.1 Draw a plan of children park.
  - 3.2 Draw a plan of a neighbourhood park.
  - 3.3 Draw a plan of a town park.
  - 3.4 Draw a plan of a botanical park.
  - 3.5 Draw a plan of a zoological park.
  - 3.6 Draw a plan of a amusement park.
  - 3.7 Draw different park system.
  - 3.8 Draw different play fields.
- 4 Prepare the drawings of road system**
- 4.1 Draw a plan of a road showing different amenities.
  - 4.2 Draw different urban roads.
  - 4.3 Draw different types of geometrical roads.
  - 4.4 Draw a by-pass road.

- 4.5 Draw different types of circular roads.
- 4.6 Draw a rectangular street system.
- 4.7 Draw a rectangular combined with diagonal street system.
- 4.8 Draw a rectangular combined with radial street system.

## **5 Prepare the drawings of road communications**

- 5.1 Draw a right of way.
- 5.2 Draw different road kerbs.
- 5.3 Draw different road junctions.
- 5.4 Draw different road crossings.
- 5.5 Draw a plan & elevation of a footover bridge.
- 5.6 Draw a plan & elevation of a over pass/ fly over.

## **6 Prepare the drawings of traffic control & master plan.**

- 6.1 Draw a zebra crossing on road.
- 6.2 Draw different traffic signs.
- 6.3 Draw different instrumental singnals.
- 6.4 Draw an island of a road system & render it.
- 6.5 Draw the lighting systems of a road.
- 6.6 Draw a master plan of a town.

## **REFERENCE BOOKS**

- 1. Town Planning  
by Rangwala
- 2. Fundamentals of Town Planning.  
by G. K. HIRASKAR
- 3. The Architecture of Towns & Cities  
By Paul D Spreiregen. A/A

**AIMS:**

To be able to develop knowledge, skill and attitude in the field of Computer Rendering & Animation (3D Max and V-ray) with special emphasis on:

- 3D Modeling.
- Materials and mapping.
- Light, camera and render.
- V-Ray.
- Animation.

**SHORT DESCRIPTION:**

3D Modeling & Animation Software , 3D Modeling, Tool Panels & It's Sub Tools, Modeling with primitives, 3D Max main tool bar, Modeling with Spline, Compound Object and Modifier Stack , Setting and Preferences menu , Massing of Building Project , Doors, Windows, AEC Extended and Stair , Finishing of Massing , Materials Basics , Texture Mapping, Lighting Basic, Camera Basic, Rendering Basic, V-Ray, Render, V-ray Materials and Lights, Animation Basic, Key frame Animation, Work Throw Animation.

**DETAIL DESCRIPTION:****PRACTICAL****1. Practice 3D Modeling & Animation Software (3D Studio Max).**

- 1.1 Install & Start 3D Studio max software.
- 1.2 Identify the 3D max Interface.
- 1.3 Practice Viewport Navigation & Configuration.
- 1.4 Arrange Customize user interface.
- 1.5 Practice New Project, Reset, Save, Save as and Set project folder.

**2. Perform Tool Panels & It's Sub Tools.**

- 2.1 Practice create tool and its sub tools like as Geometry, Shapes, Lights, Cameras etc.
- 2.2 Practice sub tools & commands of standard primitives & extend primitives under Geometry tool.
- 2.3 Familiar with sub tools & commands of Splines under Shapes Tools.
- 2.4 Identify Modify tool.
- 2.5 Identify Modifier sets.
- 2.6 Identify Hierarchy, Motion, Display and Utilities tools.

**3. Practice Modeling with primitives.**

- 3.1 Draw Box, Cone, Sphere, Geosphere, Cylinder, Tube, Torus, Pyramid, Teapot and Plane by using Standard Primitives.
- 3.2 Draw Chamfer Box, Chamfer Cylinder, Oil Tank, Capsule etc. by using Extend primitives.
- 3.3 Modify the Size/Dimension of any object by using Modifier tool.
- 3.4 Apply Modifiers on an object such as Bend, Twist etc. from modifier list.
- 3.5 Create twisted gate way (by using bend & twist modifier).

**4. Practice Main tool bar.**

- 4.1 Identify select, select by name tool.
- 4.2 Practice selection Region, Window & Cross Selection.
- 4.3 Practice Move, Rotate, Scale Tool, Mirror, Align tool.
- 4.4 Apply Snap toggle and Axis Constrain and Layer management.

4.5 Practice Maximize & Minimize Viewport toggle, Orbit, Pan, Field of view, Zoom, Zoom All, Zoom Extents and Zoom Extents All.

## **5. Modeling with Spline.**

- 5.1 Draw line, Rectangle, Circle, Ellipse, Arc, Donut, Star etc. by using spline under Shapes tool.
- 5.2 Apply modifier edit/editable spline on a 2D object (Rectangle/Star).
- 5.3 Practice the sub object of a modifier like vertex, Segment and Spline etc.
- 5.4 Create a free form Shape and Apply Extrude modifier to make 3D Object.
- 5.5 Apply Edit Mesh/Edit poly one 3D object and Familiar with sub objects line vertex, edge, Face, polygon and Element.

## **6. Practice the Compound Object and Modifier Stack.**

- 6.1 Practice Boolean, Proboolean, Loft etc. under compound object under Geometry.
- 6.2 Create a Pottery by using line, lathe modifier and Shell modifier.
- 6.3 Create a flower vase by using Loft (Compound Object), Edit mesh, Shell and turbo smooth (Modifier).
- 6.4 Create a Sofa by using Chamfer box and Modifier (Lattice, Noise and Smooth).

## **7. Practice Setting and Preferences menu.**

- 7.1 Apply unit Setup on 3D Max.
- 7.2 Prepare a 2D Plan of CAD to import 3D Max (Apply Base and Purge Command for cad)
- 7.3 Import Cad plan to Max For the project and practice DWG/DXF import option Dialogue box.
- 7.4 Create necessary layer for the projects.

## **8. Perform Massing of Building Project.**

- 8.1 Create line/Shape over the cad plan.
- 8.2 Extrude the line/Shape to create wall.
- 8.3 Create Opening for Door and Window.
- 8.4 Create Verandah, sunshade and Roof etc.
- 8.5 Apply Group Command to make Wall group, Verandah group etc.

## **9. Practice Doors, Windows, AEC Extended and Stair etc.**

- 9.1 Create Door and modify it for the project.
- 9.2 Create window and modify it for the project.
- 9.3 Create Verandah & Roof, Railing and modify it for the project.
- 9.4 Create s stair.
- 9.5 Complete the Typical Floor massing.

## **10. Perform the Finishing of Massing.**

- 10.1 Create the ground Floor plinth Ramp/Stair etc. for the Project.
- 10.2 Create GF wall, Column, stair Case, Boundary wall etc.
- 10.3 Create a main gate.
- 10.4 Create the Base, Road and Footpath etc.
- 10.5 Insert necessary landscape object for the project.

## **11. Perform Materials Basics**

- 11.1 Practice Material Editor Dialogue box and its necessary Tools.
- 11.2 Prepare a material Slot by adding Color.
- 11.3 Apply a Material to a object.

- 11.4 Create a glass Material by using Refraction Map.
- 11.5 Create a MS/SS material and assign it to the railing of the Project.
- 11.6 Create a Multisub material for Windows and assign it to the Project.

## **12. Practice Texture Mapping.**

- 12.1 Use Texture/Bitmap for material.
- 12.2 Practice tilling the texture, Real-world scale, bitmap rotate reload etc.
- 12.3 Assign Texture material slot to an object and apply UVW Map Modifier.
- 12.4 Create necessary numbers of texture materials and assign them to the project.

## **13. Perform Lighting Basic.**

- 13.1 Practice standard and Photometric Light.
- 13.2 Create Standard Light (Target Spot, Target Direct, Omni etc.)
- 13.3 Practice general parameters, Intensity parameters, spot light parameters, Shadow parameters etc.
- 13.4 Apply 1 or 2 standard light to the project and adjust the necessary parameters for best output.

## **14. Perform Camera Basic.**

- 14.1 Insert Target and free Camera.
- 14.2 Practice lens, FOV, Dolly camera etc.
- 14.3 Apply two cameras for the projects and adjust necessary parameters.
- 14.4 Set two Viewport for Rendering.

## **15. Perform Rendering Basic.**

- 15.1 Practice Render Setup dialogue Box.
- 15.2 Practice render output size and apply it for the project.
- 15.3 Select a camera View and render it.
- 15.4 Save the Render Image in different formats such as BMP, JPEG, PNG, TIF, Targaimage etc.

## **16. Perform V-Ray Render.**

- 16.1 Install V-ray software for 3d max.
- 16.2 Use v-ray as an assign render under common tab of render setup Dialogue box.
- 16.3 Practice V-ray tab and its Sub/Parameters.
- 16.4 Practice indirect illumination Tab and its Sub parameters.
- 16.5 Practice Setting tab and its sub parameters.

## **17. Perform V-ray Materials and Lights.**

- 17.1 Create a V-ray material slot for color and assign it to an object.
- 17.2 Create a V-ray material slot for bitmap and assign it to an object.
- 17.3 Create material for glass, mirror, MS, SS.
- 17.4 Create Multisub material for window and door.
- 17.5 Create V-ray light.
- 17.6 Assign V-ray material & light to the Project and render it for output.

## **18. Perform Animation Basic**

- 18.1 Practice time line & time track, Set Key, Auto key, play animation & time Configuration.
- 18.2 Create a simple animation of objects by changing its position (Move, Rotate)and by using auto key /set key.

18.3 Practice curve editor, Rope Sheet under graph editors menu.

18.4 Save an animation by using render setup.

## **19. Perform Key frame Animation.**

19.1 Create a bouncing ball animation.

19.2 Create a 10 Second animation clip of 3 or 4 objects with changing their position, Shape etc.

19.3 Create an animation with a car moving to a straight road.

19.4 Create an animation with a car moving to a 90 degree bend road.

## **20. Perform Work Throw Animation.**

20.1 Setup Camera with walk through assistant.

20.2 Animation camera rotation.

20.3 Rendering the walk through assistant.

## **REFERENCE BOOKS**

1. Mastering Auto Desk 3ds Max 2013  
by -Jeffrey Harper
2. Autodesk 3ds Max 2013 bible  
by- Kelly L.Murdock

## 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 and structural safety.**
  - 1.1 Describe and use of the plain concrete, reinforced concrete and pre-stressed concrete.
  - 1.2 Mention the advantages, disadvantages & limitations of the plain Concrete, reinforced concrete and pre-stressed concrete.
  - 1.3 Define and calculate young modulus of elasticity of concrete.
  - 1.4 Describe test procedure of crushing cubes and cylinders for compression test.
  - 1.5 Define Richter scale, tectonic plate and epicenter.
  - 1.6 Explain the necessity of considering the seismic load and wind load in designing reinforced concrete works.
  - 1.7 Mention the significant of the thrust (like tidal, cyclones etc.) to be consider in designing reinforced concrete structure in coastal zone.
  - 1.8 Explain the need for structural safety and safety provision.
- 2 Understand the properties & behavior of reinforcing steel used in RCC.**
  - 2.1 List the different types & grades of steel used in RCC and pre-stressed concrete.
  - 2.2 Mention the advantages of uses of mild steel in RCC.
  - 2.3 Describe the scope of using welded wire fabric in RCC.
  - 2.4 Mention the characteristics of plain bar, deformed bar and twisted bar and tendon.
  - 2.5 Mention the advantages of uses of deformed and twisted bar in RCC.
  - 2.6 State the minimum reinforcement used in RCC beam and slab.
- 3 Understand the concept of transformed section of beam.**
  - 3.1 Define transformed section.
  - 3.2 Explain the theory of transformed section with sketches.
  - 3.3 Express the derivation of the equation for investigating the stresses developed in concrete and steel by transformed section method.
  - 3.4 Calculate the stresses developed in rectangular beam and T-beam in WSD method.
  - 3.5 Explain balanced reinforced beam, under reinforced beam and over reinforced beam.
  - 3.6 Mention the effect of under reinforcement and over reinforcement in RCC beams.
- 4 Understand the shear stress developed in RCC beams.**
  - 4.1 Explain the effects of shear force and stress in RCC beams.
  - 4.2 State the meaning of diagonal tension.
  - 4.3 Explain the causes of creating diagonal tension in RCC beams.

- 4.4 Express the derivation of the formula to determine shear stress developed in RCC beams.
  - 4.5 Solve the problems on shear stress developed in WSD method.
  - 4.6 Solve the problems on shear stress developed in USD method.
  - 4.7 Mention the allowable shear stress for RCC beam ( $v$ ) and shear stress for concrete ( $v_c$ ).
- 5 Understand the functions of web reinforcement in RCC beams.**
  - 5.1 Define web reinforcement.
  - 5.2 Classify web reinforcement with sketches.
  - 5.3 Mention the functions of web reinforcement in RCC beams.
  - 5.4 Determine the spacing of web reinforcement (vertical & inclined) in WSD method.
  - 5.5 Determine the spacing of web reinforcement in USD method.
  - 5.6 Determine the portion of the RCC beam requiring web reinforcement.
- 6 Understand the bond stress developed in RCC beams.**
  - 6.1 State the meaning of bond stress.
  - 6.2 Express the derivation of the formula to determine bond stress developed in RCC beams.
  - 6.3 State the allowable bond stress for plain bar and deformed bar in WSD and USD methods.
  - 6.4 Determine the anchorage length of reinforcement in RCC.
  - 6.5 Explain the necessity of standard hooks of reinforcement in RCC.
- 7 Understand the flexure formula and design of RCC rectangular beam in WSD method.**
  - 7.1 State the assumptions used in developing the flexure formula.
  - 7.2 Explain the stress diagram of a loaded RCC beam.
  - 7.3 Mention the notations used in flexure formula in WSD method.
  - 7.4 Express the derivation of the flexure formula for RCC beam in WSD method.
  - 7.5 Outline the design steps of RCC rectangular beam in WSD method.
  - 7.6 State the minimum spacing of reinforcing bars in RCC beam.
  - 7.7 Design a simply supported RCC rectangular beam in WSD method.
  - 7.8 Design a semi-continuous RCC rectangular beam in WSD method.
  - 7.9 Design a continuous RCC rectangular beam in WSD method.
- 8 Understand flexure formula and design of RCC rectangular beam in USD method.**
  - 8.1 Differentiate WSD and USD method.
  - 8.2 Explain the stress diagram of loaded beam with showing the actual & equivalent rectangular stress distribution of ultimate load.
  - 8.3 State the load and load factors used in USD method.
  - 8.4 Mention the notations used in flexure formula in USD method.
  - 8.5 Express the derivation of the flexure formula in USD method.
  - 8.6 Outline the design steps of RCC rectangular beam in USD method.
  - 8.7 Design a simply supported RCC rectangular beam in USD method.
  - 8.8 Design a semi-continuous RCC rectangular beam in USD method.
  - 8.9 Design a continuous RCC rectangular beam in USD method.
- 9 Understand the design of RCC cantilever & overhanging rectangular beams in WSD method.**
  - 9.1 Determine the design load, shear force and bending moment of RCC cantilever & overhanging beams.
  - 9.2 Design a cantilever RCC rectangular beam.

- 9.3 Design an overhanging RCC rectangular beam.
- 9.4 Describe the technique of curtailment of reinforcement in cantilever RCC beams.

## **10 Understand the T-beam and design of RCC T-beams**

- 10.1 Define T-beam.
- 10.2 Identify the different parts of a typical T-beam.
- 10.3 Determine the width of flange of T-beam considering span length and slab thickness.
- 10.4 State the ratio of width of web to the depth of web for T-beams.
- 10.5 Distinguish between RCC rectangular beam and T-beam.
- 10.6 Determine the depth and width of a simply supported T-beam in respect to shear force.
- 10.7 Outline the design steps of RCC T-beam in WSD method.
- 10.8 Design a simply supported RCC T-beam in WSD method.
- 10.9 Design a semi-continuous RCC T-beam in WSD method.
- 10.10 Design a continuous RCC T-beam in WSD method.

## **11 Understand the design of RCC beam with compression reinforcement.**

- 11.1 State the meaning of double reinforced beam.
- 11.2 Differentiate between RCC single and double reinforced beam.
- 11.3 Outline the design steps of double reinforced beam.
- 11.4 Design a simply supported double reinforced beam.
- 11.5 Design a semi-continuous double reinforced beam.
- 11.6 Design a continuous double reinforced beam.

## **12 Understand the design of RCC lintel over doors & windows.**

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

### **Practical:**

1. Perform compression test of concrete cylinder for particular proportion with different water-cement ratio.
2. Perform compression test of concrete cube for particular proportion with different water-cement ratio
3. Conduct tensile strength test of mild steel for plain bar of different diameters.
4. Conduct tensile strength test of mild steel for deformed bar of different diameters.
5. Prepare a model of simply supported RCC rectangular beam as per drawing.
6. Prepare a model of semi-continuous RCC rectangular beam as per drawing.
7. Prepare a model of continuous RCC rectangular beam as per drawing.
8. Prepare a model of double reinforced simply supported rectangular beam as per drawing.
9. Prepare a model of RCC lintel as per drawing.
10. 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

**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 insurance and premium.
- To be able to understand the MDG & SDG.

**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; Concept of SDG; SDG 4,8 .

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

- 1.1 Define entrepreneurship & entrepreneur.
- 1.2 Discuss the characteristics and qualities of an entrepreneur.
- 1.3 Mention the classification of entrepreneur.
- 1.4 Discuss the necessity of entrepreneurship as a career.
- 1.5 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 the economic development process.
- 2.3 Discuss the capital accumulation or rate of savings.
- 2.4 Discuss the role of entrepreneur in the technological development and their introduction into production Process.
- 2.5 Discuss the entrepreneur in the discovery of new product.
- 2.6 Discuss the discovery of new markets.

**3. Environment for entrepreneurship development:**

- 3.1 Define the micro environment.
- 3.2 Discuss individual income, savings and consumption.
- 3.3 Define macro environment.
- 3.4 Discuss political, socio-cultural, economical, legal and technological environment.
- 3.5 Difference between micro and macro environment .

**4. Understand the concept of entrepreneurship in the theories of economic growth.**

- 4.1 Define entrepreneurship in the theories of economic growth.
- 4.2 Discuss the Malthusian theory of population and economic growth.
- 4.3 Discuss the stage theory of growth.
- 4.4 Discuss the Schumpeterian theory of economic development.
- 4.5 Discuss the entrepreneurship motive in economic development.

## **5. Understand the sources and evaluation of venture ideas in Bangladesh.**

- 5.1 Define sources of venture ideas in Bangladesh.
- 5.2 Discuss different types of sources of venture ideas in Bangladesh.
- 5.3 Define evaluation of venture ideas.
- 5.4 Discuss the factors that influence the selection of venture idea.

## **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.

## **8. Understand the business plan and the concept of the environment for entrepreneurship.**

- 8.1 Define business plan.
- 8.2 Describe the importance of business plan.
- 8.3 Discuss the contents of business plan.
- 8.4 Define environment of business.
- 8.5 Describe the factors which effect environment on entrepreneurship

## **9. Understand the concept of sources of assistance & industrial sanctioning procedure.**

- 9.1 Define sources of assistance.
- 9.2 Describe different types of sources of assistance.
- 9.3 Discuss the aid of sources.
- 9.4 Discuss the industrial policy.
- 9.5 Define foreign aid.

## **10. Understand the insurance and premium.**

- 10.1 Define insurance and premium
- 10.2 Describe the essential conditions of insurance contract.
- 10.3 Discuss various types of insurance.
- 10.4 Distinguish between life insurance and general insurance.

## **11. Understand the concept of Sustainable Development Goals (SDG)**

- 11.1 Define Sustainable development
- 11.2 State UN targets of MDG
- 11.3 State UN targets of SDG
- 11.4 Describe the importance of SDG
- 11.5 Explain the objectives of SDG
- 11.6 State the Challenges to achieve SDGs
- 11.7 Explain the actions to face the challenges of SDGs
- 11.8 State the of 7<sup>th</sup> 5 years plan
- 11.9 Mention the link of 7<sup>th</sup> 5 years plan with SDGs
- 11.10 Write down the 5 ps of sustainable development goals

## **12. Understand SDG 4,8 and 17**

- 12.1 Describe SDG 4 and its targets
- 12.2 State the elements of Quality education for TVET
- 12.3 Describe the gender equality and equal access of TVET for economic growth
- 12.4 Describe SDG 8 and its targets
- 12.5 Explain Green development, Green Economy, Green TVET & Green Jobs
- 12.6 Explain the role an entrepreneur for achieving SDG

## **Reference book :**

1. A hand book of new entrepreneur-by p.c jain.
- 2.A manual on business opportunity Identification and selection-by j.B patel and S S modi.
- 3.Uddokta unnoyan Nirdeshika -Md.Sabur khan.
- 4.Entrepreneurship- bashu and mollik.
- 5.Business Entrepreneurship-kage faruke.
6. Website, Youtube and Google