



BANGLADESH TECHNICAL EDUCATION BOARD
Agargaon, Dhaka-1207

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

ARCHITECTURE & INTERIOR DESIGN
TECHNOLOGY CODE: 687

5th SEMESTER

DIPLOMA IN ENGINEERING
PROBIDHAN-2016

ARCHITECTURE & INTERIOR DESIGN (687)

5th 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	68751	Interior Design -3	2	3	3	40	60	25	25	150
2	68752	Interior Working Drawing-1	1	6	3	20	30	50	50	150
3	68753	Interior Construction -2	2	3	3	40	60	25	25	150
4	68754	Digital Presentation & Visual Technique	1	6	3	20	30	50	50	150
5	66441	Structural Mechanics	2	3	3	40	60	25	25	150
6	65851	Accounting Theory & Practice	2	3	3	40	60	50	0	150
7	69054	Environmental Studies	2	0	2	40	60	0	0	100
Total			12	24	20	240	360	225	175	1000

68751

Interior Design-III

T	P	C
2	3	3

AIMS

- To be able to understand the planning of a shopping center.
- To be able to understand the retail and self service shop.
- To be able to prepare a presentation drawing of a shopping centre.
- To be able to understand the planning of a health service.
- To be able to prepare design of a health service.

SHORT DESCRIPTION

Planning of shopping center; basic area of shopping centre; Retail and self service Shops ; service detail of shopping center; service detail of a shopping center ; shopping centre signage; general conception of Hospitals; patient Rooms; Admitting Department of Hospital; interior component of retail shop and self service shop.

DETAIL DESCRIPTION

Theory:

1. Understand the general consideration of the planning of a shopping center.

- 1.1 Define shopping centre.
- 1.2 State the types of shopping centre.
- 1.3 Define flow diagram of shopping centre.
- 1.4 Describe the general consideration of site selection for shopping centre.
- 1.5 Describe the planning problems of shopping centre.
- 1.6 Differentiate the open market and close market.

2. Understand the basic area of shopping centre.

- 2.1 List the basic area of shopping centre.
- 2.2 Discuss the different area (entrance, atrium, aisles, storage area, display area, shops area, merchandising area, entertainment zone) of shopping centre.
- 2.3 Discuss the service area and utility area.
- 2.4 Discuss the general consideration of a parking area.

3. Understand the introduction of Retail and self service Shops.

- 3.1 Define Retail and self service Shop and its function.
- 3.2 Describe the general consideration and principles of Retail and self service Shop.
- 3.3 Discuss the inducing entrance, store space organizing and interior display.
- 3.4 Describe the parcelling and delivery system of retail shop.
- 3.5 Describe the functional aspects of shop front.

4. Understand the detail drawing of a Retail and self service shop.

- 4.1 Describe the different types of component use in retail and self service shop.
- 4.2 Define different shapes and size of component use in retail and self service shop.
- 4.3 Discuss different types of furniture and materials use in and self service shop.
- 4.4 Define different types of materials use in retail and self service ceiling.
- 4.5 Define different types of floor finish use in retail and self service floor.
- 4.6 Discuss different types of light use in retail and self service.

5. Understand the service detail of a shopping center.

- 5.1 State the back-up stock and goods transport.
- 5.2 State display window, staff entrance and staff WC.
- 5.3 Discuss the building regulation, entrance and exits.
- 5.4 Discuss the effect of windows in cold, fire, temperature and ventilations.
- 5.5 Discuss the column spacing, store depth, clear height and ducts shafts.

6. Understand shopping centre signage.

- 6.1 Define signage.
- 6.2 Describe different types of shopping centre exterior and interior signage.
- 6.3 Discuss different suitable materials used for shopping centre exterior and interior signage.
- 6.4 Discuss the consideration of using shopping centre signage.

7. Understand the general conception of Hospitals.

- 7.1 State the Hospital and Health service.
- 7.2 Define different types of hospital.
- 7.3 List the points for discussion about Hospitals.
- 7.4 Analyze the need of exist Health codes and basic building code requirement.
- 7.5 Describe the effect of project location and feasibility by limitation of existing building.

8. Understand the patient Rooms.

- 8.1 State the general conception of patient room.
- 8.2 Determine the size of the patient room.
- 8.3 Describe the closets, Furniture & its size for a patient room.
- 8.4 Explain the Doors & windows of the patient room.
- 8.5 Describe built in Equipment, medical equipment and space allocation for a patient room.
- 8.6 Describe the Lighting facilities, electrical requirements & Medical cases for patient room

9. Understand the Admitting Department of Hospital.

- 9.1 State the sequence of the functional flow-chart of Admitting Department.
- 9.2 Describe the Legend for central admitting department with adjacent medical record department for a 50-Bed Hospital.
- 9.3 State the Hospital policies.
- 9.4 State the relationship between different departments.
- 9.5 Describe the special problems of Design and Construction of a Hospital.

PRACTICAL:

1. Prepare presentation drawing of a shopping centre.

- 1.1. Draw the flow diagram of a shopping center (single storied).
- 1.2. Sketch the line plan of shopping center with given requirements.
- 1.3. Develop the line plan according to scale.
- 1.4. Draw the four side elevation of shopping center.
- 1.5. Draw the vertical section through stair and lift.

2. Prepare presentation drawing of a retail shop.

- 2.1. Draw the flow diagram of a retail shop.
- 2.2. Draw zoning diagram of retail shop.
- 2.3. Draw a presentation drawing of a retail shop.
- 2.4. Draw a front elevation of a retail shop.
- 2.5. Draw a section of a retail shop.

3. Prepare a set of drawing of interior component.

- 3.1. Draw different types of component use in retail shop.
- 3.2. Draw a ceiling layout plan of a retail shop.
- 3.3. Draw a floor finishing plan of a retail shop.

4. Prepare a signage detail drawing of a shopping centre.

- 4.1. Draw shopping centre exterior signage.
- 4.2. Draw front signage of a shop.
- 4.3. Draw signage of a shop interior.
- 4.4. Prepare a specification of a shop front signage.

5. Prepare presentation drawing of a Self-service shop.

- 5.1. Draw the flow diagram of a Self-service food court/fast food shop.
- 5.2. Draw zoning diagram of Self-service food court/fast food shop.
- 5.3. Draw a presentation drawing of a Self-service food court/fast food shop.
- 5.4. Draw a front elevation of a Self-service food court/fast food shop.
- 5.5. Draw a section of a Self-service food court/fast food shop.

6. Prepare the flow chart of a Healthcare.

- 6.1. Draw a flow diagram of 50-Bed district level Hospital.
- 6.2. Draw a flow diagram of administration department.
- 6.3. Draw a flow diagram of emergency department & diagnostic facilities.
- 6.4. Draw a flow diagram of obstetrical and out-patient department.
- 6.5. Draw a flow diagram of service facilities and laundry department.

7. Design the patient room.

- 7.1. Draw an isolated single patient room (1:50 or $\frac{1}{4}''=1'-0''$).
- 7.2. Draw a semi private patient room (1:50 or $\frac{1}{4}''=1'-0''$).
- 7.3. Draw the section of the patient rooms (2.1, 2.2) (1:50 or $\frac{1}{4}''=1'-0''$).
- 7.4. Draw sub acute care patient wardrobe elevation with dimension.

8. Prepare the Preliminary Design of a Hospital.

- 8.1. Draw the line sketch plan of a 50-Bed district level Hospital.
- 8.2. Draw the plan of 50-Bed district level Hospital in 1:100 or $\frac{1}{8}''=1'-0''$.
- 8.3. Draw the landscape plan of the hospital.
- 8.4. Draw the elevation & section of the Hospital.
- 8.5. Draw the detail car parking area.

REFERENCE BOOKS

1. Architecture Drafting and Design - Donald E. Hepler & Paul I. Wallach
2. Time Saver Standard Building Type - By Joseph De Chirra.
3. Time Saver Standard for Interior Design and Space Planning
- Joseph De chira, Julius panero & Martin zelnik
4. Planning
 - a) The Architects Hand Book - E and O. E, S. Row Land Pierce
- Patrick Cutbush Anthony Willsams

AIMS

- To be able to draw the working drawing of living room, dining room, bedroom.
- To be able to draw the working drawing of kitchen, toilet.
- To be able to draw the working drawing of a 2bedroom house.
- To be able to draw the working drawing of door and window.

SHORT DESCRIPTION

Close and open plan ; ceiling, lighting and furniture groups ; size and shape ; furniture clearance ; alcove, insulation; acoustical tile; cross ventilation; room offset; sound buffer; humidity control; general planning guides for food preparation; fixture of general bathroom; detail drawing of living room; ; detail drawing of dining room ; detail drawing of bedroom ; detail drawing of kitchen; detail drawing of toilet; detail drawing of Septic Tank & Water Reservoir; electrical drawing of 2-Bed room House; detail drawings of the door; detail drawings of the window.

DETAIL DESCRIPTION**Theory:****1. Understand the Living room.**

- 1.1. Define living area; and distinguishes between close and open plan of a living area (Living, Dining, Family etc.)/room.
- 1.2. Discuss the function, location and decor of different room of living room.
- 1.3. Discuss the ceiling, lighting and furniture groups of a living room.
- 1.4. Mention the size and shape of the living room.
- 1.5. Discuss the minimum requirements of living room.
- 1.6. Explain the planning considerations and furniture clearance of a living room.

2. Understand the dining room.

- 2.1. Define dining room.
- 2.2. Discuss the principle factors that are considered in planning the dining room.
- 2.3. Discuss the ceiling, lighting and furniture groups of a dining room.
- 2.4. Mention the size and shape of the dining room.
- 2.5. Explain the minimum width and depth needed for per person sitting.
- 2.6. Explain the passage behind chairs and furniture clearance of a dining room.

3. Understand the Bedroom.

- 3.1 Define difference types of bed room.
- 3.2 Discuss the function, location, number and decor of Bedroom.
- 3.3 Mention the standard size and shape of the bedroom.
- 3.4 Discuss the principal factors, which are considered in planning the Bedroom.
- 3.5 Discuss the ceiling, lighting and furniture groups of a bed room.
- 3.6 Explain the storage space & furniture clearance of a Bedroom.
- 3.7 Explain these architectural terms; alcove, insulation, acoustical tile, cross ventilation, delay switch, room offset, sound buffer, & humidity control.

4. Understand the kitchen.

- 4.1 Discuss kitchen function & location.
- 4.2 Discuss some following general planning guides for food preparation; arrangement, traffic lanes, storage, counters and working surface, servicing and replacement of appliances, materials, lighting, ventilation, safety, accessibility, and decoration.
- 4.3 Explain the basic shapes of kitchen room.
- 4.4 Discuss the basic work area of kitchen.
- 4.5 Explain the following architectural terms; working triangle, island, family kitchen, base cabinet, wall cabinet, counter top, service area etc.

5. Understand the bathroom/toilet.

- 5.1 Define bath/toilet and its function & location.
- 5.2 State the basic fixture of general bathroom.
- 5.3 Discuss the basic dimension of a toilet.
- 5.4 Discuss the four categories bath –
 - a. Three-fixture bath,
 - b. Compartmented bath,
 - c. Guest bath,
 - d. Utility bath,
- 5.5 Discuss the doors & windows of the bath.
- 5.6 Define the architectural terms; water closet, lavatory, fixture, open bath, sunken tub, shower stall, shower tray, square tub, rectangular tub, Jacuzzi bathtubs.

PRACTICAL:

1. Construct detail drawing of living room.

- 1.1. Draw basic common furniture with clear dimension.(scale 1:10)
- 1.2. Draw the furniture layout plan of a living room with clear measurement. (Scale 1:25).
- 1.3. Draw 2 sectional elevation of a living room.(scale 1:25)
- 1.4. Draw reflected ceiling and lighting layout plan of a living room showing different types of material. (scale 1:25)
- 1.5. Draw floor finished layout plan of a living room. (scale 1:25)

2. Construct detail drawing of dining room.

- 2.1. Draw basic common furniture with clear dimension.(scale 1:10)
- 2.2. Draw the furniture layout plan of a dining room with clear measurement. (Scale 1:25).
- 2.3. Draw 2 sectional elevation of a dining room.(scale 1:25)
- 2.4. Draw ceiling and lighting layout plan of a dining room. (scale 1:25)
- 2.5. Draw floor finished layout plan of a dining room. (scale 1:25)

3. Construct detail drawing of bedroom.

- 3.1. Draw basic common furniture with clear dimension.(scale 1:10)
- 3.2. Draw the furniture layout plan of a bedroom with clear measurement. (Scale 1:25).
- 3.3. Draw 2 sectional elevation of a bed room.(scale 1:25)
- 3.4. Draw ceiling and lighting layout plan of a bed room. (scale 1:25)

4. Construct the detail drawing of a Kitchen.

- 4.1 Draw the minimum counter width dimensions in different cases for kitchen.
- 4.2 Draw the comfortable working heights for kitchen. (Scale 1:25).
- 4.3 Draw the minimum clearance between two horizontal counters. (Scale 1:25).
- 4.4 Draw the minimum width of passages for kitchen. (Scale 1:25).
- 4.5 Draw a plan and section with detail measurements and showing different fixture (scale 1:20) (1/2"=1'-0").
- 4.6 Draw the base and wall cabinet detail showing all dimensions. (Scale 1:20) (1/2"=1'-0").

5. Construct the detail drawing of a Toilet with CAD.

- 5.1 Draw a master bath plan scale showing fixtures (Cabinet Basin, Bathtub, W.C. etc.) with all dimensions.
- 5.2 Draw the detail section of the master bath scale showing maximum fixtures and all dimensions.
- 5.3 Draw the toilet/bath plan showing fixtures (Basin, Shower tray, Long Pan/Indian Pan etc.) with all dimensions.
- 5.4 Draw the detail section of the toilet showing maximum fixtures and all dimensions.

6. Construct the detail drawing of Septic Tank & Water Reservoir with CAD.

- 6.1. Draw the Plan of a 50 user's septic tank showing the dimensions.
- 6.2. Draw the section of the septic tank.
- 6.3. Draw the Plan of a 2500 gallon underground water reservoir showing the dimensions.
- 6.4. Draw the section of the water reservoir.

7. Construct the floor plan of a 2-Bed room House with CAD.

- 7.1 Draw the floor plan scale of a 2-bedroom house.
- 7.2 Show the inside and outside detail dimension in the drawn plan.
- 7.3 Draw Front and side elevation (minimum one) of the 2-bedroom house.
- 7.4 Draw section of a 2-bedroom house showing all dimension and material symbol.

8. Construct a set of electrical drawing of 2-Bed room House with CAD.

- 8.1. Draw the different electrical symbols used in electrical layout plan.
- 8.1. Draw the ground floor plan showing electrical fittings and fixtures with dimension.
- 8.1. Draw the typical floor plan showing electrical fittings and fixtures with dimension.
- 8.1. Make the electrical fittings and fixtures schedule for the building.

9. Prepare detail drawings of the door with CAD.

- 9.1 Draw the detail plan of the panel door used in the residential building with detail dimensions.
- 9.2 Draw the detail elevation.
- 9.3 Draw the vertical section of the door with detail dimensions.
- 9.4 Draw the necessary details (at least three) of the door.
- 9.5 Draw different fixing arrangement of the doors.

10. Prepare detail drawing of the wooden pivoted window with CAD.

- 10.1 Draw the detail plan of the window used in residential building with detail dimensions.
- 10.2 Draw the detail elevation.
- 10.3 Draw the vertical section of the window with detail dimensions.
- 10.4 Draw the necessary details of the wooden pivoted window in.
- 10.5 Draw different fixing arrangements of the wooden pivoted window.

REFERENCE BOOKS

1. Architecture Drafting and Design - Donald E.Hepler & Paul I.Wallach
2. Time Saver Standard Building Type - By Joseph De Chirra.
3. Time Saver Standard for Interior Design and Space Planning
4. Joseph De chira, Julius panero & Martin zelnik
4. ওয়ার্কিং ড্রয়িং-১ -
সৈয়দ মাজহারুল হক -
বাংলাদেশ কারিগরিশিক্ষা বোর্ড।

AIMS

- To be able to understand the interior construction procedure.
- To be able to understand the construction procedure of living room.
- To be able to understand the construction procedure of false ceiling.
- To be able to prepare materials schedule, cost and development process.
- To be able to prepare construction documents of interior wall panelling.

SHORT DESCRIPTION

Materials for floor, wall, cabinet and platform, bathroom, components of a stair, living room, dining and other essential areas construction, interior construction, wall panelling.

DETAIL DESCRIPTION**Theory:****1. Understand the partition wall and wall finishes.**

- 1.1 Define partition wall.
- 1.2 Describe the characteristics of interior partition.
- 1.3 Illustrate the details of metal stud and wooden partition.
- 1.4 Describe the ceramic tile wall paneling.
- 1.5 Describe the wood frame partition systems for sound control.

2. Understand the false ceiling.

- 2.1 Define false ceilings.
- 2.2 Describe the false ceiling system.
- 2.3 Describe the function of false ceiling system.
- 2.4 Describe the different types of false ceiling system.
- 2.5 List the materials used for false ceiling system.

3. Understand the lighting fixture.

- 3.1 List the different types of lamp in general lighting purpose.
- 3.2 Describe minimum shade height.
- 3.3 Describe the residential balance lighting and down lighting.
- 3.4 Calculate the recommended lighting levels for office and industrial space.
- 3.5 Illustrate various types of lighting style.

4. Understand the wall cladding.

- 4.1 Describe the purpose of wall cladding.
- 4.2 Describe different types of wall cladding.
- 4.3 Illustrate diagrammatically the installation of aluminium composite cladding.

5. Understand the construction procedure of living room.

- 5.1 Define the work list and schedule of the living room.
- 5.2 Describe the procedure of check condition and surroundings of living room and arrange Instruments and equipment for set-out lay-out of living room.
- 5.3 Describe the procedure of establishment of the layout of living room at the site.
- 5.4 Describe the procedure of the concealed and surface work.

5.5 Describe the procedure of establishment of the checking the finishing work according to the design.

6. Understand the construction procedure of Dining room.

6.1 Define the work list and schedule of the dining room.

6.2 Describe the procedure of check condition and surroundings of dining room and arrange instruments and equipment for set-out lay-out of dining room.

6.3 Describe the procedure of establishment of the layout of dining room at the site.

6.4 Describe the procedure of the concealed and surface work.

6.5 Describe the procedure of hand over the site

7. Understand the construction procedure of Bed room.

7.1 Define the work list and schedule of the bed room.

7.2 Describe the procedure of check condition and surroundings of bed room and arrange instruments and equipment for set-out lay-out of bed room.

7.3 Describe the procedure of establishment of the layout of bed room at the site.

7.4 Describe the procedure of the concealed and surface work.

7.5 Describe the procedure of checking lighting condition before hand over the site

8. Understand the construction procedure of Bathroom/Toilet.

8.1 Define the work list and schedule of the toilet.

8.2 Describe the procedure of checking sanitary and plumbing line of the toilet.

8.3 Describe the procedure of establishment of the layout and specify the fixture point of toilet at the site.

8.4 Describe the procedure of the concealed and surface work then fixing of fixture.

8.5 Describe the procedure of checking the floor finishing odour removing and hand over the site.

9. Understand the construction procedure of Staircase.

9.1 Define stair and lift.

9.2 Distinguish between stair and stair case.

9.3 Discuss about pent house.

9.4 Mention different types of stair.

9.5 Mention and discuss in details the components of a stair (trade, riser, handrail, baluster, Balustrade, nosing, Scotia block, open string, closed string, soffit, walking line, waist slab, Landing, flight, newel post, sunlight, headroom, machine room, lift pit, hoist way, lift cabin)

10. Understand the construction procedure of kitchen.

10.1 Define the work list and schedule of the kitchen.

10.2 Describe the procedure of check condition and surroundings of bed room and arrange instruments and equipment for set-out lay-out of kitchen.

10.3 Describe the procedure of establishment of the layout of kitchen at the site.

10.4 Describe the procedure of the concealed and surface work.

10.5 Describe the procedure of checking lighting condition before hand over the site

11. Understand the calculate procedure of materials cost and estimate used in interior construction.

11.1 Define the work list and schedule of a bath room.

11.2 Describe the procedure of materials quantity and list.

11.3 Describe the procedure of estimate.

11.4 Describe the procedure of BOQ.

11.5 Describe the procedure of total estimate of the bath room works.

PRACTICAL:

1. Prepare the construction documents of living room.

- 1.1. Draw all necessary working drawings for construction of living room as per required scale.
- 1.2. Calculate all necessary materials use in the project from the drawings and prepare a BOQ (Bill of quantity).
- 1.3. Prepare a work and finance schedule of the construction with man power.

2. Prepare the construction documents of dining room.

- 2.1. Draw all necessary working drawings for construction of dining room as per required scale.
- 2.2. Calculate all necessary materials use in the project from the drawings and prepare a BOQ (Bill of quantity).
- 2.3. Prepare a work and finance schedule of the construction with man power.

3. Prepare the construction documents of bed room.

- 3.1. Draw all necessary working drawings for construction of bed room as per required scale.
- 3.2. Calculate all necessary materials use in the project from the drawings and prepare a BOQ (Bill of quantity).
- 3.3. Prepare a work and finance schedule of the construction with man power.

4. Prepare a model of kitchen.

- 4.1. Draw all necessary working drawings for making a model of a kitchen as per required scale.
- 4.2. Prepare a model making instruments such as pen, paper, knife, glue etc.
- 4.3. Make an interior model in 1:10 scale.

5. Prepare the construction documents of toilet.

- 5.1. Draw all necessary working drawings for construction of toilet as per required scale.
- 5.2. Calculate all necessary materials use in the project from the drawings and prepare a BOQ (Bill of quantity).
- 5.3. Prepare a work and finance schedule of the construction with man power.

6. Prepare the construction documents of stair.

- 6.1. Draw all necessary working drawings for construction of stair as per required scale.
- 6.2. Calculate all necessary materials use in the project from the drawings and prepare a BOQ (Bill of quantity).
- 6.3. Prepare a work and finance schedule of the construction with man power.

7. Prepare the construction documents of false ceiling.

- 7.1. Draw all necessary working drawings for construction of false ceiling as per required scale.
- 7.2. Calculate all necessary materials use in the false ceiling project from the drawings and prepare a BOQ (Bill of quantity).
- 7.3. Prepare a work and finance schedule of the construction for false ceiling with man power.
- 7.4. Prepare detail drawings of reflected false ceiling.

8. Prepare the construction documents of interior wall panelling.

- 8.1. Draw all necessary working drawings for construction of wall panelling made of wood as per required scale.
- 8.2. Draw all necessary working drawings for construction of wall panelling made of board as per required scale.
- 8.3. Draw all necessary working drawings for construction of wall panelling made of aluminium composite panel (ACP) as per required scale.

REFERENCE BOOKS

1. Architecture Drafting and Design, Donald E.Hepler, Paul I.Wallach
2. Time Saver Standard for interior design and space planning, By Joseph De Chirra, Martin zelink.
3. Interior construction and detailing for designers and Architect, David kent Ballast.

68754

Digital Presentation & Visual Technique

T	P	C
1	6	3

AIMS

- To be able to understand the Graphic Design.
- To be able to understand the Design software.
- To be able to understand the Editing software.
- To be able to understand the Commercial printing output.

SHORT DESCRIPTION

Graphics Design; form, feeling, function; Visually appealing, Colour harmony, Typeface; Convey Message, Cohesive mood, Emotional response; graphics tools, commercial printing tools and materials; Layout and Composition; Typography; role of colour in Graphics Design; Design Considerations of Graphic Design; Design Software; Image/Photo editing Software; basic shapes at Illustrator; colour, fills and strokes; compound object and make composition; typeface; Edit image at Photoshop; clipping and filtering of an Image at Photoshop; commercial advertisement/banner; design for Brochure.

DETAIL DESCRIPTION

Theory:

1. Understand the Graphics Design.

- 1.1 State the meaning of Graphics Design.
- 1.2 Discuss basic elements of Graphics Design (form, feeling, function).
- 1.3 Define the terms (Visually appealing, Colour harmony, Typeface) of form.
- 1.4 Define the terms (Convey Message, Cohesive mood, Emotional response) of feeling.
- 1.5 Define the terms (serves the purpose, easy to read and understand, executable) of function.
- 1.6 Discuss the graphics tools, commercial printing tools and materials.

2. Understand the Layout and Composition.

- 2.1 Discuss the basic principles of composition.
- 2.2 Define symmetrical, asymmetrical and radial balance
- 2.3 Discuss white space principles (minimalism, KISS).
- 2.4 Discuss 4 P'S Theory (practice, participate, pick apart, play).

3. Understand the Typography.

- 3.1 Distinguish between Fonts and typeface.
- 3.2 Anatomy of Typography.
- 3.3 Discuss Terminology of Typography.
- 3.4 Discuss the rules of Typography.
- 3.5 Define pairing types for maximum impact.

4. Understand the role of colour in Graphics Design.

- 4.1 Define colour terms (pixel, pigment, hue, value, saturation, Intensity).
- 4.2 Describe rules of colour.
- 4.3 Distinguish between RGB and CMYK.
- 4.4 Describe Psychology of colour.
- 4.5 Discuss the procedure of colour selection for commercial printing.

5. Understand the Design Considerations of Graphic Design.

- 5.1 Discuss the basic design consideration for commercial Advertisements.
- 5.2 Discuss the basic design consideration for Business cards.
- 5.3 Discuss the basic design consideration for Brochures.
- 5.4 Discuss the basic design consideration for Logos.
- 5.5 Discuss the client's requirements for Graphics Design.

6. Understand the Design Software.

- 6.1 Discuss GUI and menu bar (object, select, filter, effects etc) of Illustrator.
- 6.2 Describe different types of Illustrator tool bar (main tool, colour, character, Stock, appearance, layers, alignment etc)
- 6.3 Discuss main tool bar (selection, pen, type, line, rectangle, paint brush, pencil, rotate, scale, hand, zoom etc) of Illustrator.
- 6.4 Discuss the file format of Illustrator.
- 6.5 Discuss the printing procedure, paper and its module.

7. Understand the Image/Photo editing Software.

- 7.1 Discuss GUI and menu bar (image, layer, select, filter etc) of Photoshop.
- 7.2 Describe different types of Photoshop tool bar (main tool, colour, character, layer etc)
- 7.3 Discuss main tool bar (marquee, move, lasso, magic, crop, stamp, erase, type, rectangle, Hand, zoom etc) of Photoshop.
- 7.4 Discuss the file format, and printing procedure of Photoshop

PRACTICAL:

1. Introduce with Illustrator/ Photoshop.

- 1.1. Start Illustrator software and introduce its Graphical user interface.
- 1.2. Start Photoshop software and introduce its Graphical user interface.
- 1.3. Create a new document and save the file at Illustrator/ Photoshop.
- 1.4. Use an existing document modifies and save the file at Illustrator/ Photoshop.

2. Draw basic shapes at Illustrator.

- 2.1 Draw straight line, curve line, spiral.
- 2.2 Draw rectangle, ellipse, polygon, stars etc.
- 2.3 Draw freehand shape by using pen and pencil tool.
- 2.4 Modify existing shapes.

3. Practice colour, fills and strokes

- 3.1 Add colour to objects and use gradient fill.
- 3.2 Add strokes to objects and adjust its amount.
- 3.3 Prepare a composition by using colour group.

4. Create compound object and make composition.

- 4.1 Create compound paths and shapes by using the brush, pen, pencil tool.
- 4.2 Create art work with pathfinder, shape builder tool.
- 4.3 Create a simple composition with basic and compound objects.
- 4.4 Practice symmetrical, asymmetrical, and radial balance in a composition.

5. Prepare composition with typeface.

- 5.1 Create text by using type tool.

5.2 Set the text onto a path.

5.3 Use text warp option to adjust a text with an object.

5.4 Create a composition with paring of typeface and other compound objects.

6. Edit image at Photoshop

6.1 Insert an image, readjust by using transform, crop etc.

6.2 Create simple objects (line, rectangle, ellipse, polygon, text etc.).

6.3 Use stamp tool to match/ repair objects.

7. Practice clipping and filtering of an Image at Photoshop

7.1 Extract/ separate an image from its background.

7.2 Prepare different types of filter effect on image by using filter menu.

8. Prepare different types of commercial design.

8.1 Prepare a design for commercial advertisement/banner of given requirements.

8.2 Prepare a design for business card, Logo.

8.3 Prepare a design for invitation card.

8.4 Prepare a design for Brochure.

REFERENCE BOOKS

1. Graphic Design the new basic - Ellen Lupton
2. The elements of Graphic Design - Alex White
3. Adobe Illustrator CC Classroom in a Book - Brian Wood
4. Adobe Photoshop CC Classroom in a Book - Brie Gyncild

AIMS:

- To enable to apply the knowledge of scientific principles to problems of mechanical nature.
- To develop an understanding of mechanical properties of materials.
- To assist in applying mathematical and geometrical calculations to the analysis of statically determinate beams.

SHORT DESCRIPTION

Mechanical properties of material; Laws of forces; Moment; Friction; Centroid and centre of gravity; Moment of inertia; Torsion on circular shaft; Shear force and bending moment.

DETAIL DESCRIPTION**Theory:****1.0 Understand the important aspects of mechanical properties of materials.**

1.1 Mention the necessity to know about the mechanical properties of materials.

1.2 Define the following terms:

- a. Stress, tensile stress, compressive stress, shear stress.
- b. Strain, tensile strain, compressive strain, shear strain,
- c. Hooke's law, modulus of elasticity and modulus of rigidity.

1.3 Explain stress-strain diagram of mild steel and concrete.

1.4 Define the following terms:

- a. Elasticity, proportional limit, yield point, ultimate stress, breaking stress, working stress and factor of safety.
- b. Strength, stiffness, toughness, ductility, malleability, brittleness, creep, fatigue failure, resilience, modulus of resilience, thermal stress in simple bar and Poisson's ratio.

1.5 Compute stress, strain, modulus of elasticity and modulus of rigidity.

1.6 Solve problems involving resilience, thermal stress and Poisson's ratio.

1.7 Compute stress developed in composite bar under tension and compression.

2. Understand the concept of laws of forces.

2.1 Explain the laws of forces.

2.2 Define the following terms:

Force, co-planar forces, non-coplanar forces, concurrent forces, non-concurrent forces, co-linear forces, parallel forces, laws of equilibrium of forces.

2.3 Mention the parallelogram laws of forces.

2.4 State the composition of forces and resolution of force.

2.5 Define component of force, rectangular component and resultant of forces.

2.6 Compute the resultant force-

- a. Triangle of forces
- b. Polygon of forces
- c. Converse laws of triangle and polygon laws of forces graphically.

2.7 Calculate the resultant of forces: co-planar forces, concurrent forces, parallel forces and co-linear forces

- 2.8 Explain Lami's theorem.
- 2.9 Solve problems on Lami's theorem.

3. Understand the aspects of moment of forces.

- 3.1 Define the term moment (analytically and graphically).
- 3.2 Differentiate moment with force.
- 3.3 Explain Varignon's principle of moment.
- 3.4 Distinguish like and unlike parallel forces.
- 3.5 State the meaning of couple.
- 3.6 Mention the properties of couple.
- 3.7 Solve problems on moment of couple and moment of forces.
- 3.8 Solve problems on moment of like and unlike parallel forces.

4. Understand the concept of frictional forces.

- 4.1 State friction, static friction and dynamic friction.
- 4.2 Mention the laws of static friction and dynamic friction.
- 4.3 Explain angle of friction and co-efficient of friction.
- 4.4 Compute friction of a body on horizontal planes.
- 4.5 Compute friction of a body on inclined planes.
- 4.6 Compute frictional force acting on a ladder.

5. Understand the aspects of centroid and centre of gravity.

- 5.1 Define the terms: centroid and centre of gravity.
- 5.2 State the axis of symmetry and parallel axis.
- 5.3 Compute the centroid by the method of moment of the following sections:
 - a. rectangular b. triangular c. circular d. semi-circular
 - e. hollow f. I-shaped g. T-shaped h. L-shaped
- 5.4 Solve problem on centre of gravity of a composite parallelepiped body.

6. Understand the concept of moment of inertia.

- 6.1 State 1st and 2nd moment of area.
- 6.2 Explain the meaning of radius of gyration.
- 6.3 Mention the theorems of moment of inertia.
- 6.4 Compute the moment of inertia of plane area about any axis of the following sections:
 - a. rectangular b. triangular c. circular d. semi-circular
 - e. hollow f. I-shaped g. T-shaped h. L-shaped

7. Understand the aspects of torsion on solid and hollow circular shaft.

- 7.1 State the laws of motions.
- 7.2 Explain the term circular motion.
- 7.3 Define the terms: torsion and torsional stress.
- 7.4 Mention the fundamental assumptions of torsional stress.
- 7.5 Find the relation between torsional stress and strain.
- 7.6 Interpret the formulas relating to finding torque
- 7.7 Solve problems involving torsion.

8. Understand shear force (SF) and bending moment (BM).

- 8.1 Define the term 'beam'.
- 8.2 List different types of beams.
- 8.3 Mention various types of load on beams.

- 8.4 Define shear force and bending moment.
- 8.5 Differentiate between shear force and bending moment.
- 8.6 Mention the sign conventions of shear force and bending moment.
- 8.7 List the characteristics of shear force and bending moment diagram.
- 8.8 Calculate and draw SF and BM diagram of cantilever beams with point load, distributed load and both.
- 8.9 Calculate and draw SF and BM diagram of simply supported beams with point load, distributed load and both.
- 8.10 Calculate and draw SF and BM diagram of simply supported overhanging beam with point load, distributed load and both.

PRACTICAL:

1. Perform compression test of a timber specimen.
2. Conduct tensile test of mild steel rod and draw stress-strain curve with test results.
3. Determine the percentage elongation of mild steel.
4. Determine the centroid of a composite area.
5. Determine the resultant of a force system graphically.
6. Show the resultant of forces by using force board.
7. Prove the Lami's theorem by using force board.
8. Practice to determine the co-efficient of friction of timber, concrete and mild steel.
9. Practice to determine reactions of a beam by using spring balance.

REFERENCE BOOKS:

1. Structural Mechanics - W Morgan and D T Williams
2. Structural Mechanics - Singer / Popov
3. Mechanics of Materials - Philip Gustave Laurson and Williams Junkin Cox
4. Structural Mechanics - A. K. Upadhyay Published by SK Kateria & Sons, India.
5. Applied Mechanics - R.S Khurmi

65851

Accounting Theory & Practice

T P C
2 3 3

AIMS

- To be able to understand the principles and practices of book keeping and accounting.
- To be able to understand the procedures of general accounting, financial accounting and their applications.
- To be able to understand the concept of income tax , VAT & Public works accounts.

Course Outlines

Concept of book keeping and accounting; Transactions; Entry systems; Accounts; Journal; Ledger; Cash book; Trial balance; Final accounts; Cost account & financial accounting; Income Tax; Public works accounts.

DESCRIPTION;

Theory

1. Concept of book keeping and accounting.

- 1.1 Define book keeping and accountancy.
- 1.2 State the objectives & of book keeping.
- 1.3 State the advantages of book keeping.
- 1.4 Differentiate between book keeping and accounting.
- 1.5 State the necessity and scope of book keeping and accounting.

2. Transactions Analysis.

- 2.1 Define transactions and business transaction.
- 2.2 Describe the characteristics of transaction.
- 2.3 Discuss the classification of transaction.

3. Entry system of Accounting.

- 3.1 State the aspects of transactions.
- 3.2 Define single & double entry system ..
- 3.3 Discuss the principles of double entry system.
- 3.4 Distinguish between single entry and double entry system of book keeping.
- 3.5 Justify whether double entry system is an improvement over the single entry system.

4. Classification of accounts.

- 4.1 Define accounts.
- 4.2 State the objectives of accounts.
- 4.3 Illustrate different type of accounts with example.
- 4.4 Define "Golden rules of Book keeping".
- 4.5 State the rules for "Debit" and "Credit" in each class of accounts.
- 4.6 Define accounting cycle.

5. Journal .

- 5.1 Define Journal.
- 5.2 State the functions of Journal.
- 5.3 Mention the various names of Journal.
- 5.4 Interpret the form of Journal.

6. ledger.

- 6.1 Define ledger.
- 6.2 Interpret the form of ledger.
- 6.3 State the functions of ledger.
- 6.4 Distinguish between Journal and Ledger.
- 6.5 Explain why ledger is called the king of all books of accounts.
- 6.6 Explain the following terms: Balance, Balancing; Debit balance; credit balance.

7. Cash book & Its Classification.

- 7.1 Define cash book.
- 7.2 Classification of cash book.
- 7.3 Explain cash book as both Journal and Ledger.
- 7.4 Define discount.
- 7.5 Explain the different types of discount.

8. Trial balance.

- 8.1 Define trial balance.
- 8.2 State the object of a trial balance.
- 8.3 Discuss the methods of preparation of a trial balance.
- 8.4 Explain the limitations of a trial balance.
- 8.5 Prepare trial balance from given ledger balance. (practical)

9. Final accounts.

- 9.1 State the components of final account.
- 9.2 Distinguish between trial balance and balance sheet.
- 9.3 Select the items to be posted in the trading account, profit & loss account and the balance sheet.
- 9.4 State the adjustment to be made from the given information below or above the trial balance.
- 9.5 Explain the following terms: revenue expenditure; capital expenditure; depreciation; annuity method demnishing balance method, machine hour method

10. Cost and financial accounting.

- 10.1 Define financial accounting.
- 10.2 State the objectives of financial accounting.
- 10.3 Define cost accounting.
- 10.4 State the elements of direct cost and indirect cost.
- 10.5 Discuss the capital budgeting
- 10.6 Explain the following terms:
 - a. Fixed cost b. Variable cost c. Factory cost d. Overhead cost e. Process cost f. Direct cost g. Operating cost h. Standard cost

11. Income Tax

- 11.1 Define Income Tax.
- 11.2 State the objects of Income Tax.
- 11.3 Classification of assesses.
- 11.4. Taxable income of assesses.
- 11.5 Tax rebate.
- 11.6 Explain the following terms: Income tax year; assessment year, NBR.

12. Public works accounts.

- 12.1 State the important aspects of public works accounts.

- 12.2 Describe the main features of public works accounts.
- 12.3 Define Value Added Tax (VAT)
- 12.4 State the merits and demerits of VAT.
- 12.5 Explain the following terms :Revenue ; Grant ; Bill; Voucher.

PRACTICAL

1. Identify the transaction from given statements stating reasons.
2. Determine Debtor (Dr) and Creditor (Cr.) from given transactions applying golden rules.
3. Journalize from given transactions.
4. Prepare ledger from given transactions.
5. Prepare double column cash book from given transactions showing balances.
6. Prepare triple column cash book from given transaction and find out the balances.
7. Prepare analytical and imprest system of cash book.
8. Prepare trial balance from the given ledger balance.
9. Prepare trading account, profit & loss account and balance sheet from the given trial balance & other information.
10. Prepare cost sheet showing prime cost, factory cost, cost of production, total cost and selling price.

REFERENCE BOOKS

1. Book-keeping & Accounting - Prof. Gazi Abdus Salam
2. Principles of Accounting - Hafiz uddin
3. Cost Accounting - Prof. Asimuddin Mondol
৪. হিসাবরক্ষণ ও হিসাববিজ্ঞান - পরেশ মন্ডল
৫. উচ্চ মাধ্যমিক হিসাববিজ্ঞান - হক ও হোসাইন
৬. আয়কর - ড. মনজুর মোরশেদ

AIMS

- To be able to understand the basic concepts of environment and environmental pollution.
- To be able to understand the concepts of ecology and ecosystems
- To be able to understand the basic concepts of environmental degradation relating to industrial production.
- To be able to understand the major environmental issues and problems.
- To be able to understand legislative measures to protect environment.

SHORT DESCRIPTION

Basic concepts of environment; natural resources; biogeochemical cycling; ecology and ecosystem; air; water; soil; solid waste management; development and environment; global environmental challenges; legislative protection of environment.

DETAIL DESCRIPTION**Theory:****1. Understand the multidisciplinary nature of environmental studies.**

- 1.1. Define environment, nature, pollution, pollutant, contaminant.
- 1.2. Describe the scope of environmental studies.
- 1.3. Describe the importance of environmental studies.
- 1.4. Describe the formation and structure of the Earth.
- 1.5. Describe the earth's natural system.
- 1.6. Describe the changing attitudes to the natural world.
- 1.7. Mention the main components of environment.
- 1.8. Define natural and man-made environment.
- 1.9. Distinguish between natural and man-made environment.

2. Understand the natural resources.

- 2.1. Define natural resources.
- 2.2. Classify natural resources.
- 2.3. Describe forest resources.
- 2.4. Describe water resources.
- 2.5. Describe mineral resources.
- 2.6. Describe food resources.
- 2.7. Describe energy resources.
- 2.8. Describe land resources.
- 2.9. Describe environmental problem relating to resources use.
- 2.10. Describe the role of an individual in conservation of natural resources.

3. Understand the biogeochemical cycling.

- 3.1. Define biogeochemical cycle.
- 3.2. Describe hydrologic cycle.
- 3.3. Describe carbon cycle.

- 3.4. Describe nitrogen cycle.
- 3.5. Describe oxygen cycle.
- 3.6. Describe phosphorus cycle.
- 3.7. Describe sulfur cycle.
- 3.8. Describe nutrient cycle.

4. Understand the ecology and ecosystem.

- 4.1. Define ecology and ecosystem.
- 4.2. Structure and function of an ecosystem.
- 4.3. Describe the components of ecosystem.
- 4.4. Explain the stability of ecosystem.
- 4.5. Describe ecological factors.
- 4.6. Describe interdependency between abiotic and biotic component.
- 4.7. Describe the meaning of following terms: species, population, community, ecological succession, community periodicity, climax community, ecological niche, habitat, plankton, nekton, ecological indicator, evolution, adaptation, producers, consumers, decomposers, food chains, food webs, ecological pyramids, bio-concentration, bio-magnification, biodiversity, threatened species, endanger species, extinct species, exotic species, biodiversity conservation and biogeography.
- 4.8. Describe energy flow in the ecosystem.
- 4.9. Describe the ecosystem of pond, ocean, estuary, grassland, cropland, forest, desert and mangrove.

5. Understand the air as a component of environment.

- 5.1. Define air.
- 5.2. Describe the composition of the clean dry atmospheric air at ground level.
- 5.3. Describe the atmospheric structure.
- 5.4. Define air pollution.
- 5.5. Describe major air pollutants and their impacts.
- 5.6. Describe the sources of air pollutants.
- 5.7. Explain the formation of photochemical smog and its effects.
- 5.8. Describe the effects of air pollution on vegetation, animal, human health and materials and resources.
- 5.9. Define sound and noise.
- 5.10. Describe the classification of sound.
- 5.11. Describe the effects of noise.

6. Understand the water as a component of environment.

- 6.1. Define water.
- 6.2. Describe the characteristics of water.
- 6.3. Describe the sources of water.
- 6.4. Describe the uses of water.
- 6.5. Explain that the water is a universal solvent.
- 6.6. Define water pollution, biological oxygen demand (BOD), effluent treatment plant (ETP).
- 6.7. Describe the sources of water pollution.
- 6.8. Describe the effects of water pollution.

7. Understand the soil as a component of environment.

- 7.1. Define soil.
- 7.2. Describe the constituents of soil.

- 7.3. Define soil pollution.
- 7.4. Describe causes soil degradation.
- 7.5. Describe the sources of soil pollution.
- 7.6. Describe the effects of soil pollution.

8. Understand the concept of solid waste management.

- 8.1. Define solid waste, refuse, garbage, rubbish, trashes, demolition and construction waste, e-waste, agricultural waste, pathological waste, radioactive waste, hazardous waste, 3R, 4R.
- 8.2. List the sources of solid waste.
- 8.3. Mention the classification of solid waste.
- 8.4. Mention the methods of collection of solid waste.
- 8.5. Describe the recycling of solid wastes.
- 8.6. Describe resource recovery from solid waste.
- 8.7. Describe the potential method of disposal of solid waste.
- 8.8. Describe control measures of urban and industrial wastes.

9. Understand the development and environment.

- 9.1. Define environmental ethics and environmental stress.
- 9.2. Describe environmental stress.
- 9.3. Define sustainable development.
- 9.4. Define urbanization.
- 9.5. Describe the causes of urbanization.
- 9.6. Describe the effects of urbanization on environment.
- 9.7. Define industrialization.
- 9.8. Describe the causes of industrialization.
- 9.9. Describe the effects of industrialization on environment.

10. Understand the global environmental challenges.

- 10.1. Define greenhouse gas and greenhouse effects.
- 10.2. Make a list of greenhouse gases and their contribution on greenhouse effects.
- 10.3. Describe the causes and consequences of greenhouse effects.
- 10.4. Describe acid rain.
- 10.5. Describe importance of ozone layer.
- 10.6. Define ozone depleting substances (ODS).
- 10.7. Describe ozone layer depletion mechanism.
- 10.8. Describe hazardous waste.
- 10.9. Describe chemicals pesticides.
- 10.10. Describe radioactive pollution.
- 10.11. Describe natural disaster.

11. Understand the legislative protection of environment.

- 11.1. Define environmental impact assessment (EIA) and environmental auditing (EA).
- 11.2. Mention environmental act and legislations prescribed for air, noise, water, soil and wild life protection.
- 11.3. Describe environmental conservation act 1995 in Bangladesh.
- 11.4. Describe the environment conservation rule 1997 in Bangladesh.
- 11.5. Describe the environmental framework in Bangladesh.
- 11.6. Describe The Montreal Protocol and The Kyoto Protocol.
- 11.7. Describe role of an individual in prevention of pollution.

REFERENCES:

1. Fundamentals of Environmental Studies, Mahua Basu and S. Xavier, Cambridge.
2. Ecology and Environment, P.D. Sharma, Rastogi Publications.
3. Basics of Environmental Science, Michael Allaby, Routledge.
4. Environmental Science, Jonathan Turk and Amos Turk, Saunders golden sunburst series.