

**PROPOSED CURRICULUM AND SYLLABUS
FOR DIPLOMA COURSE IN
ARCHITECTURE**

**SYLLABUS
(FIFTH SEMESTER)**

WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION

PREPARED BY:

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PROJECT AND DISASTER MANAGEMENT

Subject Code
ARCH / 5 / T1 /
PDMNT

Course offered in
Fifth Semester

Course Duration
17 weeks

2 lecture contact periods
per week

Full Marks
100

OBJECTIVE

This subject provides the students of polytechnics with an exposure to the art and science of management principles, functions, techniques and skills that are essential for maximising attainment of the organisational goals with the available manpower and resources. Upon successful completion of this subject, the students shall be equipped with the fundamental knowledge of management which should make them confident in facing the challenges of their responsibilities in the different organisational scenarios.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION TO MANAGEMENT SCIENCE	3
	2	PRODUCTION MANAGEMENT	6
	3	MATERIALS MANAGEMENT	2
B	4	FINANCIAL MANAGEMENT	2
	5	MARKETING & SALES MANAGEMENT	3
	6	QUANTITATIVE TECHNIQUES	4
C	7	DISASTER MANAGEMENT	6
	8	ENERGY EFFICIENT BUILDING	4

CONTACT PERIODS: 30

INTERNAL ASSESSMENT: 4

TOTAL PERIODS: 34

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3	11	ANY TWENTY	ONE	20 x 1 = 20	FOUR	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	5 X 10 = 50
B	4, 5, 6	8				THREE			
C	7, 8	6				TWO			

DETAIL COURSE CONTENT

GROUP - A

11 PERIODS

Module 1 INTRODUCTION TO MANAGEMENT SCIENCE

3

Principles & functions of management — Contributions of F.W. Taylor, Henry Fayol, Max Weber and Elton Mayo & Roethlisburger in development of the theories of management science.

Module 2 PRODUCTION MANAGEMENT

6

PRODUCTION PLANNING: Routing – Loading – Scheduling — PRODUCTION CONTROL: Expediting – Dispatching — Materials Handling — Work Study — Productivity — QUALITY MANAGEMENT: Tools & Techniques – Quality Management System.

Module 3 MATERIALS MANAGEMENT

2

OBJECTIVES & FUNCTIONS: Purchase function – Stores function — INVENTORY MANAGEMENT: ABC, VED analyses.

GROUP - B

9 PERIODS

Module 4 FINANCIAL MANAGEMENT

2

Financial Ratios — Elements of Costing — Auditing

Module 5 MARKETING & SALES MANAGEMENT

3

Objectives & Functions — Marketing of products & Services — Advertising & Sales Promotion — Consumer Behaviour

Module 6 QUANTITATIVE TECHNIQUES

4

Linear programming (graphical method only) — NETWORK ANALYSIS: PERT – CPM

GROUP - C**10 PERIODS****Module 7 DISASTER MANAGEMENT****6**

Earthquake – Building; Effects of Seismic Forces on Building; Precautions for Buildings against Earthquake

Module 8 ENERGY EFFICIENT BUILDING**4**

Non-conventional Energy Resources like Solar energy, Wind energy, Tidal energy – Environmental problems as Global Warming, Ozone Depletion.

REFERENCE BOOKS

1. Essentials of Management / Kontz / McGraw-Hill of India
2. Human Behaviour at Work: Organizational Behaviour / Keith Davis & Newstrom / McGraw-Hill of India
3. Production Management & Control / Nikhil Barat / U.N. Dhar & Co.
4. Production Management / Keith Lockyer / ELBS
5. Marketing Management / Philip Kotler / Prentice Hall of India
6. Lectures on Management Accounting / Dr. B.K. Basu / Basusri Bookstall, Kolkata
7. An Insight into Auditing: A Multi-dimensional Approach / Dr. B.K. Basu / Basusri Bookstall, Kolkata
8. Business Strategies, Financial Management & Management Accounting / S.K. Poddar / The Association of Engineers (India)
9. Architecture and Town Planning / Satish Chandra Agarwal / Dhanpat Rai & Co.. (P) Ltd.
10. Non- Conventional Energy Resources / S.K. Dubey, S. K. Bhargav / Dhanpat Rai & Co.(P) Ltd.
11. Green Architecture – A Guide to Sustainable Design / Michael J. Crosbie / Rockport Publishers, Massachusetts

DESIGN OF STRUCTURES - II

Subject Code	Course offered in	Course Duration	2 lecture contact periods	Full Marks
ARCH / 5 / T2 / DOS2	Fifth Semester	17 weeks	per week	100

OBJECTIVE

On satisfactory completion of the course, the students should be in a position to:—

- understand the different properties of reinforced cement concrete;
- understand the basic assumptions regarding RCC design by Working Stress Method and will have an idea regarding the different relevant design parameters;
- understand Limit state method of design and will have an idea regarding safety and serviceability, characteristic & design values, partial safety factors
- solve simple design problems of RCC beams, slabs, columns with foundations and staircases.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION TO REINFORCED CEMENT CONCRETE	2
	2	DESIGN OF RCC BEAMS BY WORKING STRESS METHOD & LIMIT STATE METHOD	12
	3	DESIGN OF RCC COLUMNS BY WORKING STRESS METHOD & LIMIT STATE METHOD	4
B	4	DESIGN OF RCC SLABS BY WORKING STRESS METHOD	4
	5	DESIGN OF FOUNDATIONS BY WORKING STRESS METHOD	4
	6	DESIGN OF TWO FLIGHT STAIRCASES BY WORKING STRESS METHOD	4

CONTACT PERIODS: 30

INTERNAL ASSESSMENT: 4

TOTAL PERIODS: 34

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3	FOR 10 MARKS	15	COMBINATION OF QUESTIONS VARYING FROM 1 TO 2 MARKS	20	FOUR	FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	5 X 10 = 50
B	4, 5, 6	FOR 15 MARKS				FIVE			

DETAIL COURSE CONTENT

GROUP – A	14 PERIODS
Module 1 INTRODUCTION TO REINFORCED CEMENT CONCRETE	2
1.1 Aggregate – fineness modulus	
1.2 Properties of concrete: Grade of concrete, consistency of concrete	
1.3 Permissible stresses	
1.4 Requirement of good concrete	
Module 2 DESIGN OF RCC BEAMS BY WORKING STRESS & LIMIT STATE METHOD	12
2.1 BASIC ASSUMPTIONS OF WORKING STRESS METHOD	
2.2 DESIGN PARAMETERS: Effective depth – neutral axis – cover – moment of resistance –under-balanced sections – over-balanced sections – critical sections – span to depth ratio	
2.3 SAFETY & SERVICEABILITY OF LIMIT STATE METHOD- Limit State of collapse- Limit State of serviceability	
2.4 CHARACTERISTIC AND DESIGN VALUES AND PARTIAL SAFETY FACTORS	
2.5 DESIGN OF SINGLY REINFORCED RECTANGULAR SECTIONS BY TWO METHODS with uniformly distributed load, shear and bond — Numerical solutions of simple problems — Typical reinforcement details	
2.6 DESIGN OF T-BEAMS, L-BEAMS (NEUTRAL AXIS WITHIN FLANGE ONLY) , LINTELS (TRIANGULAR LOAD CASE ONLY — Numerical solutions of simple problems— Typical reinforcement details	
Module 3 DESIGN OF RCC COLUMNS BY WORKING STRESS & LIMIT STATE METHOD	4
3.1 Difference between LONG AND SHORT COLUMNS	
3.2 Design of axially loaded square columns by working stress method and Limit State Method — Numerical solutions of simple problems — Typical reinforcement details	
GROUP – B	12 PERIODS
Module 4 DESIGN OF RCC SLABS BY WORKING STRESS METHOD	4
4.1 DESIGN OF ONE-WAY SLAB, simply supported on either ends and cantilever — Numerical solutions of simple problems — Typical reinforcement details	
4.2 DESIGN OF TWO-WAY SLAB with and without corners held down — Numerical solutions of simple problems — Typical reinforcement details	
Module 5 DESIGN OF FOUNDATIONS BY WORKING STRESS METHOD	4
5.1 Introduction & sketches of various types of footings and general rules for design	
5.2 Design of an isolated RCC square footing for an axially loaded short column resting directly on bearing soil for uniform thickness of the footing slab – Calculation for depth from bending moment and punching shear consideration, Rankine’s depth of foundation — Numerical solutions of simple problems — Typical reinforcement details	
Module 6 DESIGN OF TWO- FLIGHT STAIRCASES BY WORKING STRESS METHOD	4
6.1 Technical terms used in connection with staircases	
6.2 Design of stairs simply supported on edges at landing levels — Numerical solutions of simple problems — Typical reinforcement details	

REFERENCE BOOKS

1. IS: 456 – 2000 / Bureau of Indian Standards
2. SP – 16 / Bureau of Indian Standards
3. Design of RCC Structures / S. Ramamurtham & R. Narayan / Dhanpat Rai Pub. Co. Pvt. Ltd.
4. RCC Design / Amarjit Agarwal / S. K. Kataria & Sons, Delhi
5. Treasure of RCC Design / Sushil Kumar / Standard Book House, Delhi
6. Concrete Structures / V. N. Vazirani & M. M. Rathwani / Khanna Publishers, Delhi

CONTEMPORARY ARCHITECTURE – I

Subject Code
ARCH / 5 / T3 / COA1

Course offered in
Fifth Semester

Duration
17 weeks

3 lecture contact periods
per week

Full Marks
100

OBJECTIVE

On satisfactory completion of the course, the students should be in a position to understand and explain the development of different philosophy and styles of world architecture since the Industrial Revolution to the mid of the twentieth century.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	IMPACT OF INDUSTRIAL REVOLUTION	4
	2	REBELLION AGAINST THE MACHINE	4
B	3	FUNCTIONALISM	10
	4	INTERNATIONAL STYLE	6
	5	THE TRIUMPH OF MODERN ARCHITECTURE	10
C	6	REVISION BETWEEN THE WARS	5
	7	MODERN ARCHITECTURE WITH A HUMAN FACE	6

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

TOTAL PERIODS: 51

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	5	ANY TWENTY	ONE	1 X 20 = 20	TWO	FIVE QUESTIONS, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4, 5, 6	15				FIVE			
C	7, 8	5				TWO			

DETAIL COURSE CONTENT

GROUP – A INDUSTRIAL REVOLUTION

8 PERIODS

Module 1 IMPACT OF INDUSTRIAL REVOLUTION

4

New social outlook of the common man in the POST INDUSTRIAL REVOLUTION ERA – VICTORIAN attitude denouncing the past – Need for larger span and taller structure – Availability of new building materials: STEEL, IRON & GLASS – Modern methods of production and modern transport – GREAT EXHIBITIONS of 19th century and achievements in engineering skills – Study of the (i) CRYSTAL PALACE, LONDON (1851) by SIR JOSEPH PAXTON – Culmination of Early Victorian technology, and, (ii) EIFFEL TOWER, PARIS (1889) by ALEXANDRE GUSTAVE EIFFEL – Development of structural iron, new language of lattice structures, the open girder.

Module 2 REBELLION AGAINST THE MACHINE

4

- 2.1 ARTS & CRAFTS : Late 19th century English movement reviving handicrafts and reforming architecture by using traditional building crafts & local materials – Study of the BARN, EXMOUTH, DEVON (1897) by E.S. PRIOR: Organic relationship of a building to its locality.
- 2.2 ART NOUVEAU : Decorative movement in European architecture – Flowing & sinuous naturalistic ornament – Avoidance of historical architectural traits – Study of the following work: CASA BATLLÓ, BARCELONA (1906) by ANTONIO GAUDI Y CORNET.

GROUP – B MODERN ARCHITECTURE

26 PERIODS

Module 3 FUNCTIONALISM

10

- 3.1 DEVELOPMENTS IN AMERICA : (a) CHICAGO SCHOOL: Need for optimising the use of available floor space – Invention of the electric lift, telephone & tubular post – Beginning of the skyscrapers – THEME: FORM FOLLOWS FUNCTION – Study of the CARSON PIRIE SCOTT, CHICAGO (1904) by LOUIS HENRY SULLIVAN – (b) PRAIRIE SCHOOL: Open plan – Functionalist in approach – Organic Style: local material & local

characteristics – Technology in the service of humanity – Stress of horizontals and low, long lines – Easy access between indoor & outdoor – Study of the ROBIE HOUSE, CHICAGO (1910) by FRANK LLOYD WRIGHT.

- 3.2 DEVELOPMENTS IN EUROPE : BAUHAUS SCHOOL: Open plan – Programmatic Functionalist approach leading to rational simplicity – Anti-ornament ethics: absolute plainness of solid blocks, exposed steel frames, walls of glass, rectilinear boxes with no visible roof – Study of the BAUHAUS BUILDINGS, DESSAU, GERMANY (1926) by W. GROPIUS.

Module 4 INTERNATIONAL STYLE

6

Term INTERNATIONAL STYLE coined by PHILIP CORTELYOU JOHNSON in 1932 – Global uniformity of architecture – Standardisation of building elements – Assymetrical compositions – Cubic general shapes – Study of the VILLA SAVOY, POISSY, FRANCE (1931) by LE CORBUSIER (CHARLES ÉDOUARD JEANNERET) – Extended the idea of simplicity into visual oneness leading to monolithic vision and minimalism — THEME: LESS IS MORE coined LUDWIG MIES VAN DER ROHE – Study of the FARNSWORTH HOUSE, PLANO, ILLINOIS (1945-51) by MIES .

Module 5 TRIUMPH OF MODERN ARCHITECTURE

10

THEME: FUNCTION FOLLOWS FORM coined by MIES – To organise all functions to be sheltered and all the materials suitable for use within a form — MONOLITHICISM: Study of the following work: SEAGRAM BUILDING, NEW YORK (1958) by MIES — TWIN VARIATION: Study of the NATIONAL CONGRESS BUILDING, BRASILIA (1960) by OSCAR SOARES FILHO NIEMEYER — LE MODULAR based on Golden Section: Study of *any one* of the following works: UNITÉ D'HABITATION, MARSEILLE, FRANCE (1952) by CORBUSIER.

GROUP – C REVISION OF MODERNISM

11 PERIODS

Module 6 REVISION BETWEEN THE WARS

5

- 6.1 EXPRESSIONISM: Tired of plain surfaces and architectural forms – Closer to sculpture than architecture – Study of the EINSTEIN TOWER OBSERVATORY, POTSDAM, GERMANY (1921) by ERICH MENDELSON.
- 6.2 ART DECO: Name derives from a Paris exhibition of decorative and industrial art in 1925 – Unfunctional modernism – Use of motifs from the past – Study of the CHRYSLER BUILDING, NEW YORK (1929) by WILLIAM VAN ALLEN.

Module 7 MODERN ARCHITECTURE WITH A HUMAN FACE

6

Unison of organic architecture with international style: Study of the FALLING WATERS, BEAR RUN, PENNSYLVANIA (1939) by F. L. WRIGHT— Distinction between 'served' and 'servant' spaces: Study of the A. N. RICHARDS MEDICAL LABORATORIES, PHILADELPHIA (1961) by LOUIS I. KAHN.

REFERENCE BOOKS

1. A History of Architecture / Sir Banister Fletcher / Butterworth Heinemann (Hb), CBS (Pb)
2. The Story of Architecture FROM ANTIQUITY TO THE PRESENT / Jan Gympel / Könemann
3. Puzzle of Architecture / Robin Boyd / Melbourne Architectural Press
4. ARCHITECTURE HIGHLIGHTS! / Adams Hubertus and Paul Jochen / DUMONT monte
5. AT THE END OF THE CENTURY: ONE HUNDRED YEARS OF ARCHITECTURE / Edited by Russel Ferguson / The Museum of Contemporary Art, Los Angeles, Harry N. Abrams Inc., Publishers
6. CRASH COURSE IN ARCHITECTURE / Eva Howarth / Caxton Editions

MATERIALS & METHODS OF CONSTRUCTION – III

Subject Code	Course offered in	Duration	3 lecture contact periods	Full Marks
ARCH / 5 / T4 / MMC3	Fifth Semester	17 weeks	per week	100

OBJECTIVE

On satisfactory completion of the course, the students will:—

- (i) have idea regarding different types of finishes, viz. floor finishes, internal plastering, external plastering, pointing, white washing & colour washing and wall cladding;
- (ii) understand the functions, properties and uses of different types of adhesives used for bonding of surfaces of wood, metal, glass & plastics;
- (iii) understand the construction principles of upper floors made of timber, RCC (slab floor, beam & slab floor, flat slab, ribbed floor) and pre-cast concrete;
- (iv) understand the function, uses & details of partition walls (brick masonry), false ceilings and curtain walls;
- (v) have idea regarding formwork;

- (vi) have knowledge regarding the technical terms associated with pitched roof construction and understand the concepts of different types of pitched roofs;
- (vii) have idea regarding steel trusses up to 40 ft. span;
- (viii) understand the fixing details of the two roofing materials, viz. tiles & corrugated galvanised iron sheet;
- (ix) understand the process of drainage of pitched roof through gutter.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A (MATERIALS)	1	FINISHES	15
	2	ADHESIVES	3
B (CONSTRUCTION)	3	UPPER FLOORS	8
	4	PARTITION WALLS (BRICK MASONRY)	3
	5	FALSE CEILINGS (SUSPENDED TYPE)	3
	6	CURTAIN WALLS	3
	7	FORMWORKS	3
	8	PITCHED ROOFING	7

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

TOTAL PERIODS: 51

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	10	ANY TWENTY	ONE	20	FOUR	ANY FIVE, TAKING AT LEAST TWO FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4, 5, 6, 7, 8	15				SIX			

DETAIL COURSE CONTENT

GROUP - A MATERIALS 18 PERIODS

Module 1 FINISHES 15

- 1.1 FLOOR FINISHES: Cement Concrete Flooring (IPS), Terrazzo Flooring, Ceramic Flooring, Stone Flooring, Marble & Granite Flooring, Acid-Proof Flooring, PVC Flooring, Timber Parquet Flooring
- 1.2 WALL AND CEILING FINISHES: INTERNAL PLASTERING: Cement Plaster, Gypsum Plaster or Plaster of Paris, Gypsum Plaster Board — EXTERNAL PLASTERING: Cement Plaster (Smooth Wood Float Finish, Pebble Dash Finish, Textured Finish, Rough Cart Finish or Sponge Finish) — POINTING — WHITE WASHING & COLOUR WASHING — WALL CLADDING (DADO & SKIRTING): Wood, Brick Tiles, Ceramic Tiles, Stone Tiles (Marble & Granite)
- 1.3 PAINTS: Constituents – Functions – Types

Module 2 ADHESIVES 3

- 2.1 Names of adhesives used for bonding of surfaces of wood, metal, glass and plastic
- 2.2 Functions, Properties & Types

GROUP - B CONSTRUCTION 27 PERIODS

Module 3 UPPER FLOORS 8

- 3.1 Suspended floors in timber – single
- 3.2 R.C.C. FLOORS: Slab (one-way, two-way & cantilever) – Beam & slab – Flat Slab – Ribbed floor
- 3.3 PRE-CAST CONCRETE FLOOR

Module 4 PARTITION WALLS (BRICK MASONRY) 3

Definition – Types – Uses – Simple details of construction

Module 5 FALSE CEILINGS (SUSPENDED TYPE) 3

Definition – Types – Uses – Simple details of construction

Module 6 CURTAIN WALLS 3

Definition – Uses – Simple details of construction

Module 7 FORMWORKS 3

- 7.1 Definition – materials used in formwork – requirements of good formwork
- 7.2 Rules to be followed in the removal of formwork at different locations
- 7.3 Formwork: Steel & Timber – Their comparison

- 8.1 Technical terms associated with pitched roof construction
- 8.2 Types of pitched roofs: Lean-to-roof – Coupled roof – Closed couple roof – King Post Roof Truss – Queen Post Roof Truss (concept only)
- 8.3 Steel trusses up to 40 ft. span
- 8.4 Roofing materials: Tiles – Corrugated Galvanised Iron sheet — Their fixing details
- 8.5 Roof drainage through gutter

REFERENCE BOOKS

- 1. Building Construction Volume I, II, III & IV (Metric Ed.) / J.K. McKay & W.B. McKay / Orient Longman
- 2. The Construction of Buildings Volume 1, 2, 3, 4 & 5 / R. Barry / English Language Book Society
- 3. A Text Book of Materials and Construction / TTTI
- 4. A Text Book of Building Construction / S. P. Aurora & S. P. Bindra
- 5. Building Construction / Sushil Kumar / Standards Publishers Distributors, Delhi

**ESTIMATING-COSTING,
SPECIFICATION & VALUATION - I**

Subject Code ARCH / 5 / T5 / ECSV1	Course offered in Fifth Semester	Course Duration 17 weeks	3 lecture contact periods per week	Full Marks 100
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OBJECTIVE

On satisfactory completion of the course, the students will be in a position to:—

- (i) understand the purpose of estimating along with its different types;
- (ii) understand the principles & different methods of estimating;
- (iii) prepare approximate estimated cost of a proposed building on plinth area basis;
- (iv) prepare detailed quantity estimate of a one storied double-roomed single apartment building for civil work, electrical work (on point basis), its doors & windows and some of its sanitary work along with annual repair and maintenance estimate.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION TO ESTIMATING	4
	2	PRINCIPLES OF ESTIMATING	8
B	3	APPROXIMATE ESTIMATE	3
	4	ESTIMATE OF BUILDINGS	18
C	5	ESTIMATE OF DOORS & WINDOWS	6
	6	ESTIMATE OF SANITARY WORKS	6

CONTACT PERIODS: 45

INTERNAL ASSESSMENT: 6

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	6	20	ONE	20	TWO	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	5 X 10 = 50
B	3, 4	13				FOUR			
C	5, 6	6				TWO			

DETAIL COURSE CONTENT

GROUP – A

12 LECTURES

Module 1 INTRODUCTION TO ESTIMATING

4 DEFINITION OF

ESTIMATING — PURPOSE OF ESTIMATING — Introduction to IS: 1200 — **TYPES OF ESTIMATING:** Detailed Estimate – Preliminary or Approximate or Rough Estimate – Quantity Estimate or Quantity Survey – Revised Estimate – Supplementary Estimate – Complete Estimate – Annual Maintenance or Repair Estimate (A. M. or A. R. Estimate) — **ABSTRACT OF ESTIMATE**

Module 2 PRINCIPLES OF ESTIMATING

8

GENERAL ITEMS OF WORK — PRINCIPLE UNITS OF MEASUREMENT FOR VARIOUS ITEMS OF WORK — PRINCIPLE UNITS OF RATE FOR PAYMENT — MODE OF MEASUREMENT for the principle items of works & materials — METHODS FOR ESTIMATING: Long and Short wall method or 'out-to-out' and 'in-to-in' method or PWD method – Centre Line method — Problems

GROUP – B **21**

Module 3 APPROXIMATE ESTIMATE **3**

IMPORTANCE of approximate estimate — PURPOSE of an approximate estimate — TYPES of approximate estimate — PLINTH AREA OR SQUARE-METRE METHOD — Estimated Cost of a proposed building on plinth area basis — Problems

Module 4 ESTIMATE OF BUILDINGS **18**

Detailed quantity estimate of a one storied single roomed single apartment building with front veranda having veranda pillars with isolated footing, a living-dining, a kitchen, a water closet and a toilet (with different sections & heights of walls) including electrical estimation (on point basis) with annual repair and maintenance estimate [The necessary orthographic projections are to be provided by the teacher concerned.]

GROUP – C **12**

Module 5 ESTIMATE OF DOORS& WINDOWS **6**

Actual consumption of door and window fittings with the mode of measurement — Estimate of a single leaf wooden panelled door with frame — Estimate of a solid core flush door — Estimate of a glazed window shutter

Module 6 ESTIMATE OF SANITARY WORKS **6**

Estimate of Surface Drain, Household Septic Tanks and Yard Gully

REFERENCE BOOK

1. ESTIMATING, COSTING, SPECIFICATION AND VALUATION IN CIVIL ENGINEERING / M.CHAKRABORTI / M.CHAKRABORTI, 21B, Bhabananda Road, Kolkata – 700 026
2. ESTIMATING & COSTING IN CIVIL ENGINEERING THEORY & PRACTICE INCLUDING SPECIFICATION & VALUATION / B. N. DUTTA / UBSPD

ALTERNATIVE BUILDING TECHNOLOGY

(ONE OF THE COURSES OFFERED AS ELECTIVE)

ALTERNATIVE BUILDING TECHNOLOGY – I

Subject Code	Course offered in	Course Duration	2 lecture contact periods	Full Marks
ARCH / 5 / T6 / ABT1	Fifth Semester	17 weeks	per week	100

DETAIL COURSE CONTENT

1.0 Introduction to cost effective technology philosophy of cost effective technology.

2.0 Foundation

Stub Foundation: Salient features – Method of construction – Advantages

Arch Foundation: Salient features – Method of construction – Advantages

3.0 Wall

Rat Trap Bond (Using Brick): Salient features – Method of construction – Advantages

Fly ash Brick: Salient features – Method of construction – Advantages – Construction details of walls using fly ash brick

Hollow Concrete Brick: Salient features – Method of construction – Advantages – Construction details of walls using H.C.B.

Consolidated Mud Block: Salient features – Method of construction – Advantages – Construction details of walls using C.M.B.

Mud: Conventional method of mud walling – Improved technology

Bamboo: Names of different types of bamboo which can be used in walling – Methods of bamboo walling – Precautions to be taken

4.0 Lintel

Corbelling: Methods of corbelling – Advantages over concrete lintel

Arch: Different types of arches

5.0 Roof

Filler Slab: Salient features – Method of construction – Advantages

Funicular sheet:

Pre-cast R.C. Plank:

Pre-cast R.C. Channel Unit:

Pre-fabricated brick panel:

Pre-cast L-panel:

Brick jack arch:

6.0 Finishing

Non Errodable Mud Plaster: Salient features – Method of preparation – Method of application – Advantages

Polyurethane

7.0 Fittings & Fixtures Ferro Cement Door Shutter: Salient features – Method of production – Joining details – Advantages

Concrete Door / Window Frames:

Frame less Door / Window:

Bamboo: Names of different types of bamboo which can be used in production of door & window – Method of preparation.

INTERIOR DESIGN

(ONE OF THE COURSES OFFERED AS ELECTIVE)

INTERIOR DESIGN – I

Subject Code ARCH / 5 / T6 / ID1	Course offered in Fifth Semester	Course Duration 17 weeks	2 lecture contact periods per week	Full Marks 100
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OBJECTIVE

On satisfactory completion of the course, the students will be in a position to:—

- (i) understand the role of interior design in architecture and difference of the same with interior decoration;
- (ii) understand the factors affecting interior design;
- (iii) have a comprehensive idea regarding the history of different styles in furniture design during the 'English', 'French', 'American' and 'Modern' periods;
- (iv) understand the guidelines for interior designing of residential, commercial and office spaces.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION	2
	2	FACTORS EFFECTING INTERIOR DESIGN	1
	3	ANTHROPOMETRIC DATA STUDY CONSIDERING ERGONOMICS	4
B	4	HISTORY OF STYLES IN FURNITURTE DESIGN	8
C	5	INTERIOR SPACE DESIGN	15

CONTACT PERIODS: 30

INTERNAL ASSESSMENT: 4

TOTAL PERIODS: 34

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2, 3	8	20	ONE	20	TWO	FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	5 X 10 = 50
B	4	8				TWO			
C	5	9				FOUR			

DETAIL COURSE CONTENT

GROUP – A

7 PERIODS

Module 1 INTRODUCTION 2

- 1.1 DEFINITION of Interior Design
- 1.2 ROLE of interior design in architecture
- 1.3 DIFFERENCE of interior design with interior decoration
- 1.4 ELEMENTS OF DESIGN: Point – Line – Plane – Form – Texture – Colour
- 1.5 PRINCIPLES OF DESIGN: Scale – Proportion – Symmetry – Balance – Rhythm – Monotony – Contrast – Harmony

Module 2 FACTORS AFFECTING INTERIOR DESIGN 1

Location, needs and preferences — Availability of materials — Financial limit and maintenance

Module 3 ANTHROPOMETRIC DATA STUDY CONSIDERING ERGONOMICS 4

Definition of ANTHROPOMETRY & ERGONOMICS – Movement and Circulation spaces – Furniture sizes

GROUP – B

8 PERIODS

Module 4 HISTORY OF STYLES IN FURNITURE DESIGN

- 4.1 ENGLISH PERIOD (16th century to 19th century): Tudor – Elizabethan – Jacobean – William & Mary – Queen Anne – Georgian
- 4.2 FRENCH PERIOD (17th century to 19th century): Louis XII – Louis XIII – Louis XIV – Louis XV – Louis XVI – Directoire – Empire
- 4.3 AMERICAN PERIOD (17th century to 19th century): Colonial – Federal – Victorian
- 4.4 CONTEMPORARY FURNITURE DESIGN: Application of NEW MATERIALS on MODERN FURNITURE Design: Tubular Steel – Plywood – Moulded Plastic - Examples.

GROUP – C

15 PERIODS

Module 5 INTERIOR SPACE DESIGN

Analysis of activity, selection of furniture and layout considering circulation of the following spaces:—

- (i) RESIDENTIAL SPACE: Living room – Dining space – Bed room – Kitchen – Toilet
- (ii) COMMERCIAL SPACE: Eatery (restaurant, snack bar, cafeteria, coffee shop, speciality restaurant) – Showroom of a jewellery – Boutique - Garments' shop – Leather goods' shop
- (iii) OFFICE SPACE: General office – Reception – Executive's chamber – Conference room with service facility.

LANDSCAPE DESIGN

(ONE OF THE COURSES OFFERED AS ELECTIVE)

LANDSCAPE DESIGN – I

Subject Code	Course offered in	Course Duration	2 lecture contact periods	Full Marks
ARCH / 5 / T6 / LD1	Fifth Semester	17 weeks	per week	100

OBJECTIVE

On successful completion of the course, the students will:—

- (i) understand the role of landscaping in architecture;
- (ii) understand the basic principles of landscape architecture;
- (iii) have a comprehensive idea regarding the historical and modern garden patterns;
- (iv) be in a position to understand the guidelines for landscaping of residential areas, commercial areas, parks & play areas and plaza & squares.

MODULAR DIVISION OF THE SYLLABUS

GROUP	MODULE	TOPIC	CONTACT PERIODS
A	1	INTRODUCTION	1
	2	PRINCIPLES OF LANDSCAPE ARCHITECTURE	3
B	3	HISTORICAL GARDEN PATTERNS	5
	4	MODERN GARDEN PATTERNS	4

C	5	GUIDELINES FOR LANDSCAPING OF SPECIFIC AREAS	17
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CONTACT PERIODS: 30

INTERNAL ASSESSMENT: 4

TOTAL PERIODS: 34

EXAMINATION SCHEME

GROUP	MODULE	OBJECTIVE QUESTIONS				SUBJECTIVE QUESTIONS			
		TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS	TO BE SET	TO BE ANSWERED	MARKS PER QUESTION	TOTAL MARKS
A	1, 2	3	ANY TWENTY	ONE	20	TWO	ANY FIVE, TAKING AT LEAST ONE FROM EACH GROUP	TEN	10 X 5 = 50
B	3, 4	9				THREE			
C	5	13				FIVE			

DETAIL COURSE CONTENT

GROUP – A	4PERIODS
Module 1 INTRODUCTION	1
1.1 DEFINITION of Landscaping	
1.2 ROLE of landscaping in architecture	
Module 2 PRINCIPLES OF LANDSCAPING	3
2.1 EVOLUTION of Landscaping: Oriental and Occidental	
2.2 RELATIONSHIP of man, building and landscaping	
2.3 ELEMENTS of landscaping	
GROUP – B	9 PERIODS
Module 3 HISTORICAL GARDEN PATTERNS	5
3.1 ORIENTAL: Mughal & Japanese	
3.2 OCCIDENTAL: French & Renaissance	
Module 4 MODERN GARDEN PATTERNS	4
Rock Garden – Indoor Garden – Terrace Garden	
GROUP – C	17PERIODS
Module 5 GUIDELINES FOR LANDSCAPING	
5.1 RESIDENTIAL: Individual and group of buildings	4
5.2 COMMERCIAL: Shopping Mall	4
5.3 RECREATIONAL: Parks and Play Areas	4
5.4 PUBLIC SPACES: Plaza and Squares	5

SESSIONAL COURSES OFFERED IN 5TH SEMESTER, PART - III

PROFESSIONAL PRACTICE-II

Subject Code ARCH / 5 / S1 / PP2	Course offered in Fifth Semester	Course Duration 17 weeks	1 lecture contact period per week	Full Marks 50
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COURSE & EXAMINATION SCHEDULE

NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
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PROFESSIONAL PRACTICE – II	FIFTH SEMESTER	Continuous internal assessment of 25 marks is to be carried out by the teachers throughout the semester where marks allotted for assessment of sessional work undertaken is 25. Distribution of marks: Report & Drawing Sheets – 15, viva-voce – 10. External assessment of 25 marks shall be held at the end of the Part – II First semester on the entire syllabi Distribution of marks: Report & Drawing Sheets – 15, Viva-voce – 10.
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OBJECTIVE

On satisfactory completion of the course, the students will be in a position to individually prepare a) a precise report on spatial appraisal of Indian architecture either traditional or contemporary b) Thorough measured drawing of architecture/ architectural elements/ pieces belonging to a particular style, period, influence, social or cultural importance etc. after an educational tour.

CONTACT PERIODS: 15

INTERNAL ASSESSMENT: 2

TOTAL PERIODS: 17

MATERIAL TESTING LABORATORY

Subject Code	Course offered in	Course Duration	Full Marks
ARCH / 5 / S2 / MTL	Fifth Semester	17 weeks	50
CONTACT PERIODS		INTERNAL ASSESSMENT	TOTAL
15 @ 1 sessional contact periods per week for 15 weeks		2 periods	17 periods

OBJECTIVE

On satisfactory completion of the course, the students should be in a position to:—

- verify the physical properties of brick regarding size, shape, colour, striking sound & water absorption;
- understand the grading of aggregates;
- verify the physical properties of cement regarding normal consistency & initial setting time;
- verify the physical properties of concrete regarding its compressive strength;
- understand the actual work of bending, binding and placing of reinforcement in reinforced cement concrete work through site visits.

EXAMINATION SCHEME

- Continuous Internal Assessment of 25 marks** is to be carried out by the subject teacher(s) throughout the Part – III First Semester. **Distribution of marks:** Performance of Job – 18, Notebook – 7.
- External Assessment of 25 marks** shall be held at the end of the Part – III First Semester where students are to perform one test from the entire syllabus. One job per student from any one of the jobs done is to be performed. Job is to be set by lottery system. **Distribution of Marks:** on spot job – 10, viva-voce – 10; notebook – 5.

DETAIL COURSE CONTENT

JOB 1. To test bricks regarding size, shape, colour, striking sound and water absorption.	2
JOB 2. To undertake Sieve Analysis of aggregates.	3
JOB 3. To determine Normal Consistency of a cement paste.	2
JOB 4. To determine Initial Setting Time of cement by vicat apparatus.	2
JOB 5. To determine Workability of concrete mix depending upon the water-cement ratio (Slump Test).	2
JOB 6. To test Compressive Strength of Concrete.	2
JOB 7. To undertake Study of model or actual work of bending, binding & placing reinforcement in reinforced concrete beam, slab, column & isolated footings through visits to local buildings under construction.	2

REFERENCE BOOK

Material Testing Laboratory Manual for Civil Engineers / S.K. Kaushik, C.B. Kukreja, V.K. Gupta, K. Kishore / Standard Publishers Distributors, 1705-B Nai Sarak, Delhi

WORKING DRAWING - II

Subject Code
ARCH / 5 & 6 / S3 / SWKD2

Course offered in
Part – III

Full Marks
150

OBJECTIVE

On satisfactory completion of the course, the students will be in a position to prepare a set of working drawings of a G + 4 storied apartment in simple framed structure, drawn manually.

COURSE & EXAMINATION SCHEDULE

NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
WORKING DRAWING – II (GROUP – A)	FIFTH SEMESTER	CONTINUOUS INTERNAL ASSESSMENT OF 75 MARKS IS TO BE CARRIED OUT BY THE TEACHERS THROUGHOUT THE TWO SEMESTERS WHERE MARKS ALLOTTED FOR ASSESSMENT OF SESSIONAL WORK UNDERTAKEN IN 5TH SEMESTER IS 35 AND 6TH SEMESTER IS 40. EXTERNAL ASSESSMENT OF 75 MARKS SHALL BE HELD AT THE END OF THE PART – III SECOND SEMESTER ON THE ENTIRE SYLLABI OF WORKING DRAWING – II (GROUPS - A & B). DISTRIBUTION OF MARKS: DRAWING SHEETS – 50, VIVA-VOCE – 25.
WORKING DRAWING – II (GROUP – B)	SIXTH SEMESTER	

MODULAR DIVISION OF THE SYLLABUS

SHEET NO.	TOPIC	CONTACT PERIODS
WORKING DRAWING – II (GROUP – A) FIFTH SEMESTER		75
1	GROUND FLOOR PLAN	12
2	TYPICAL FLOOR PLAN	12
3	ROOF PLAN	8
4, 5 & 6	ELEVATIONS	12
7	SECTIONAL ELEVATIONS	16
8	TUTORIAL	15
WORKING DRAWING – II (GROUP – B) SIXTH SEMESTER		75
9	FOUNDATION	8
10	STRUCTURAL DETAILS	12
11	ELECTRICAL LAYOUT	12
12	KITCHEN & TOILET DETAIL	12
13	WATER SUPPLY & SEWERAGE	8
14	DETAIL DRAWING	8
15	TUTORIAL	15

I

CONTACT PERIODS: 150 INTERNAL ASSESSMENT: 20 PERIODS TOTAL PERIODS: 170

DETAIL COURSE CONTENTS

A set of working drawings in 1 : 50 scale, unless other wise mentioned, of a simple framed structure. The architectural design may be one designed by the student in the subject Architectural Design & Drawing – I (Group – B) in Part – II Second Semester, or may be supplied by teacher-in-charge.

SHEET NO. 1	GROUND FLOOR PLAN	12
Showing dimensions of all rooms / space, thickness of walls, inner & outer plaster line, door / window marking & their position, widths of flight, landing, tread, stairwell (if any), no. of treads deep line in floor, drop line in toilet, kitchen & veranda.		
SHEET NO. 2	TYPICAL FLOOR PLAN	12
Showing same as above.		
SHEET NO. 3	ROOF PLAN	8
<i>Ghundi</i> , slope & ridge line, Rain Water Pipe, Anti Siphonage Pipe, Soil Pipe Vent Pipe, Over Head Tank, ring main, thickness of parapet wall, and sectional plan of staircase with relevant information.		
SHEET NOS. 4, 5 & 6	ELEVATIONS (FRONT, REAR & TWO SIDE ELEVATIONS)	12
Showing Ground Level, Plinth Level, sill level, lintel level, floor level, roof level, staircase roof level, their height & total height, height of parapet wall, roof projection (if any) and specification of elevational features.		
SHEET NO. 7	SECTIONAL ELEVATIONS	16
Two sectional elevations through staircase, kitchen, toilet, veranda, showing main entrance to staircase, exit from staircase to roof, flights of steps in section and elevation, Ground Level, Plinth Level, floor level, roof level, sill & lintel level, roof / roof parapet height, loft height.		

ARCHITECTURAL DESIGN & DRAWING - II

Subject Code
ARCH / 5 & 6 / S4 / SAD2

Course offered in
Part – III

Full Marks
250

COURSE & EXAMINATION SCHEDULE

SUBJECT CODES	NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
ARCH / 5 & 6 / S4 / SAD2	Architectural Design & Drawing (S) – II (Group – A)	Fifth semester	Continuous Internal assessment of 75 marks is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken in 5TH semester is 35 & in 6TH semester is 40. Distribution of marks for Design problem is 50 & Time Sketch is 25. External assessment of 75 marks shall be held at the end of the Part – III Second Semester on the entire syllabi of Architectural Design & Drawing(S) – II (Groups – A & B). Distribution of marks: Drawing Sheets – 50, Viva-voce – 25.
	Architectural Design & Drawing (S) – II (Group – B)	Sixth semester	
ARCH / 6 / T6 / ADD2	Architectural Design & Drawing – II	Sixth semester	A twelve-hour examination of 100 marks , spread over two days, is to be held during the Part – III Second Semester examinations on the syllabus of Architectural Design & Drawing (S) – II. Out of 2 questions set; any 1 is to be answered. The 2 internal assessments of 3 hours duration each are to be taken on the same syllabus. The Municipal Building Rules and the National Building Code of India, are allowed during the examinations.

ARCHITECTURAL PROJECT WORK & SEMINAR

Subject Code
ARCH / 5 & 6 / S5 / APRWS

Courses offered in Part – III

Full Marks
150

OBJECTIVE

Project Work is intended to provide opportunity for students to develop understanding of the interrelationship between different courses learnt in the entire diploma programme and to apply the knowledge gained in a way that enables them to develop & demonstrate higher order skills. The basic objective of a project class would be to ignite the potential of students' creative ability by enabling them to develop something which has social relevance, aging, it should provide a taste of real life problem that a diploma-holder may encounter as a professional. It will be appreciated if the polytechnics develop interaction with local industry and local developmental agencies viz. different panchayet bodies, the municipalities etc. for choosing topics of projects and / or for case study. The course further includes preparation of a Project Report which, among other things, consists of technical description of the project. The Report should be submitted in two copies, one to be retained in the library of the institute. The Report needs to be prepared in computer using Word and CADD software wherever necessary.

Seminar on Project Work is intended to provide opportunity for students to present the Project Work in front of a technical gathering with the help of different oral, aural and visual communication aids which they learnt through different courses in the Parts – I & II of the diploma course. In the Seminar, students are not only expected to present their Project Work, but also to defend the same while answering questions arising out of their presentation.

GENERAL GUIDELINE

Project Work is conceived as a group work through which the spirit of team building is expected to be developed. Students will be required to carry out their Project Works in groups under supervision of a lecturer of their core discipline who will work as a Project Guide. It is expected that most of the lecturers of the core discipline will act as project guide and each should supervise the work of at least two groups. Number of students per group will vary with the number of lecturers acting as Project Guide and student strength of that particular class.

COURSE & EXAMINATION SCHEDULE

SUBJECT CODE	NAME OF THE COURSES	COURSES OFFERED IN	MARKS ALLOTTED
ARCH / 5 & 6 / S5 / SPRW	Architectural Project Work (Group – A)	Fifth semester	Continuous Internal assessment of 75 marks is to be carried out by the teachers throughout the two semesters where marks allotted for assessment of sessional work undertaken in 5TH semester is 35 & in 6TH semester is 40. External assessment of 75marks shall be held at the end of the Part – III Second Semester on the seminar to be presented by the students on the entire syllabi of Architectural Project Work. The external examiner is to be from industry / engineering college / university / government organisation. Distribution of marks: Drawing Sheets, Model & Project Report –50, Seminar – 25.
	Architectural Project Work (Group – B)	Sixth semester	

MODULAR DIVISION OF THE SYLLABUS

COURSE	MODULE	TOPIC	CONTACT PERIODS
ARCHITECTURAL PROJECT WORK (GROUP – A) Fifth Semester Course Duration: 15 Weeks 4 sessional contact periods per week Contact Periods: 60	1	Introduction of the subject “Architectural Project Work” and group formation	2
	2	Topic selection and finalisation	4
	3	Study (from Standards & Reference Books)	8
	4	Case Study (from Primary & Secondary Sources)	
	5	Site Analysis and Zoning	4
	6	Identification of space and area requirement	2
	7	Flow Chart and Bubble Diagram	8
	8	Design in orthographic projection	32
ARCHITECTURAL PROJECT WORK (GROUP – B) Sixth Semester Course Duration: 15 Weeks 4 sessional contact periods per week Contact Periods: 60	9	Review of Design in the form of Seminar	10
	10	Preparation of Presentation Drawings	12
	11	Preparation of Municipal Drawings	4
	12	Drawing a View and / or making a Model	8
	13	Calculation of Preliminary Estimate	4
	14	Project Report Preparation	12
	15	Seminar on Final Presentation	10

CONTACT PERIODS: 60

INTERNAL ASSESSMENT 8

TOTAL PERIODS: 68

THE ARCHITECTURAL PROJECT

Each group, under the guidance of a project guide, will select one topic and precaution should be taken so that it does not become repetition of those undertaken under the subjects Architectural Design & Drawing – I & II. While selection of the topic, care should be taken to see that its scale remains well within the scope of the particular group of students. The choice of medium & mode of presentation, the scale of drawing (s), and, the number of sheets are to be decided by the students under the guidance of the project guide.
