Course Structure for Undergraduate Programme

Leading to the award of

Degree of Bachelor of Architecture

Session 2019-'20 onwards

Duration of the courses

10 Semesters (Five Years)

Adopted in the 224th Meeting of the DAC held on 26 Jun & 01 Jul 2019, the 1st Meeting of the BOAC held on 04 Jul 2019; and,
Approved in the 22nd Meeting of the Senate held on 08, 10 & 11 Jul 2019.

Minor modifications adopted in the 10th Meeting of the DFC held on 07 & 10 Jul 2020, the 3rd Meeting of the DUGC held on 30 Jul 2020, and the 2nd Meeting of the BOAC held on 07 Aug 2020

Department of Architecture, Town and Regional Planning
Indian Institute of Engineering, Science and Technology, Shibpur

Salient features of the 10-semester B Arch Programme

1.0 As per the overall guideline of the Council of Architecture, the 5-year curricular structure is divided into two parts.

1.1 The First Part of three years duration attributing knowledge and skill about visual design, hard and soft skills of drawing, materials and methods of building construction, evolution of architectural space and related technology over the years, plumbing services, building services, building science, surveying, structural design, landscaping etc., all culminating towards developing a student to undertake architectural design of different scale and complexity.

1.2 The Second Part of two years duration having four components, viz. one entire semester of professional training in an architectural farm, two semesters of classes preparing a student for advanced courses leading towards different master programmes and specializations in the form of Electives, architectural designs of advanced complexity, and one semester for undergraduate level thesis where a student explores on one architectural project of real-life situation under a supervisor.

1.3 Due to the interdisciplinary nature of the B Arch programme, a number of courses are historically offered by the Departments of Humanities & Social Sciences, Mathematics, Applied Mechanics, and Civil Engineering, during the first three years.

2.0 Components of the B Arch Course Structure

2.1 Total credits for the 10-semester B Arch Programme, as enumerated in Table 1, is 240 @ 24 credits per semester.

2.2 Emphasis of sessional courses within the Programme is illustrated by the fact that though the number of theoretical and sessional courses are almost equal, 44% of the total credits need to be earned through theoretical courses compared to 56% credits through sessional ones.

Table 1. Semester-wise distribution of no. of courses offered, credits and contact periods required per week in the proposed B Arch Course Structure

Year/ Sem. ('YY')	Credit	No. of Courses – Credit (No. of pds.)			Pds./ Wk.		Year/ Sem. ('YY')	Credit	No. of Courses – Credit (No. of pds.)			Pds./ Wk.
		Theory	Sessional						Theory	Sessional		
			With contact pd.	Without contact pd.						With contact pd.	Without contact pd.	
11	**24**	5 – 14 (14)	4 – 10 (17)	-	31		12	**26**	5 – 14 (14)	5 – 12 (20)	-	34
21	**27**	6 – 17 (17)	3 – 10 (15)	-	32		22	**28**	5 – 14 (14)	5 – 12 (18)	1* – 2	32
31	**24**	5 – 12 (12)	3 – 12 (18)	-	30		32	**26**	4 – 10 (10)	4 – 14 (21)	1* – 2	31
41	**27**	5 – 15 (15)	2 – 12 (15)	-	30		42	**8**	-	-	3** – 8	-
51	**26**	3 – 10 (10)	3 – 14 (18)	1†– 2	28		52	**24**	-	1 – 12 (16)	2‡ – 12	16
Total: 75 courses with 240 credits | 38 theoretical courses with 106 credits (106 pds.) | 37 sessional courses with 134 credits (158 pds.)												

Legend

*: Educational Tours – AP2291 and AP 3291

**: Internship – Professional Training (AP4291), Training Report (AP4292), Training viva-voce (AP4293)

†: Comprehensive viva-voce (AP5191)

‡: B Arch thesis related examinations: Architectural Thesis II (AP 5291) and Architectural Thesis Viva-Voce (AP 5292)

2.3 In fact, out of the two compulsory Departmental Elective courses one is earmarked as theoretical (AP4121) and the other as sessional (AP5173).

3.0 Structure of the Curriculum

3.1 The courses offered in the B Arch programme can be classified into nine types of courses, viz. Fundamental Courses, Departmental Core, Departmental Electives, Open Electives, Projects and Thesis, Comprehensive Viva-Voce, Internship, Educational Tour, and Non-Credit Courses. The structure of these courses has been illustrated through Table 2.

Table 2. Structure of the B Arch curriculum

Type of courses	No. of courses (Credits)	Percentage
Fundamental Courses (FC)	15 courses (38 credits)	19% of total no. of courses (16% of total credit)
Departmental Core (DC)	37 courses (99 credits)	49% of total no. of courses (41% of total credit)
Departmental Electives (DE)	2-3 courses (5-8 credits)	3% of total no. of courses (3% of total credit)
Open Electives (OE)	1-2 courses (3-6 credits)	2% of total no. of courses (2% of total credit)
Projects and Thesis (PR)	11 courses (78 credits)	15% of total no. of courses (33% of total credit)
Comprehensive Viva-Voce (CV)	1 course (2 credits)	1% of total no. of courses (1% of total credit)
Internship (IN)	3 courses (8 credits)	4% of total no. of courses (3% of total credit)
Educational Tour (ET)	2 courses (4 credits)	3% of total no. of courses (2% of total credit)
Non-Credit Courses (NC)	2 courses (0 credit)	3% of total no. of courses (0% of total credit)
Total	**75 courses (240 credits)**	100% of total no. of courses (100% of total credit)

3.2 The detailed semester-wise course structure is enumerated in the following pages where colour code of Table 2 has been used for easy identification of the class of a course.

Course Structure – First Year First Semester (1st Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP1101	Design Fundamentals	3	0	0	100	3
AP1102	Materials and Methods of Construction I	3	0	0	100	3
MA1102	Mathematics IA	3	0	0	100	3
AM1103	Engineering Mechanics	3	0	0	100	3
HU1103	English for Engineers	2	0	0	50	2
	Sub total	**14**	**0**	**0**	**450**	**14**
Practical Courses						
AP1171	Basic Design	0	0	6	150	4
AP1172	Descriptive Geometry I	0	0	6	150	4
WS1171	Workshop Practice	0	0	3	50	2
	Sub total	**0**	**0**	**15**	**350**	**10**
TOTAL		**29**			**800**	**24**
SA1171	Non-Credit Course (NCC / Physical Training)	0	0	2	50	

Course Structure – First Year Second Semester (2nd Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP1201	Materials and Methods of Construction II	3	0	0	100	3
MA1202	Mathematics II~~A~~	3	0	0	100	3
CS1201	Introduction to Computing & Programming	3	0	0	100	3
AM1203	Strength of Materials	3	0	0	100	3
CE1202	Fundamentals of Ecology and Environmental Pollution	2	0	0	50	2
	Sub total	**14**	**0**	**0**	**450**	**14**
Practical Courses						
AP1271	Architectural Design Studio I	0	0	6	150	4
AP1272	Descriptive Geometry II	0	0	6	150	4
AP1273	Details of Construction Practice I	0	0	3	100	2
CS1271	Computer Lab	0	0	3	50	2
	Sub total	**0**	**0**	**18**	**450**	**12**
TOTAL		**32**			**900**	**26**
SA1271	Non-Credit Course (NCC / Physical Training)	0	0	2	50	

Course Structure – Second Year First Semester (3rd Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP2101	Evolution of Architecture I	3	0	0	100	3
AP2102	Materials and Methods of Construction III	3	0	0	100	3
AP2103	Landscape Architecture and Site Planning	3	0	0	100	3
AP2104	Plumbing Services	3	0	0	100	3
CE2117	Structural Analysis	3	0	0	100	3
CE2118	Surveying	2	0	0	50	2
	Sub total	**17**	**0**	**0**	**550**	**17**
Practical Courses						
AP2171	Architectural Design Studio II	0	0	9	200	6
AP2172	Details of Construction Practice II	0	0	3	100	2
AP2173	Computer Aided Design and Drawing	0	0	3	100	2
	Sub total	**0**	**0**	**15**	**400**	**10**
TOTAL		**32**			**950**	**27**

Course Structure – Second Year Second Semester (4th Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP2201	Evolution of Architecture II	3	0	0	100	3
AP2202	Materials and Methods of Construction IV	3	0	0	100	3
AP2203	Climatology	2	0	0	50	2
AP2204	Building Services I: Illumination and Electrical Installations	3	0	0	100	3
CE2217	Design of Reinforced Concrete Structures	3	0	0	100	3
	Sub total	**14**	**0**	**0**	**450**	**14**
Practical Courses						
AP2271	Architectural Design Studio III	0	0	9	200	6
AP2272	Details of Construction Practice III	0	0	3	100	2
AP2273	Landscape and Site Planning Practice	0	0	3	100	2
CE2287	Surveying Practice	0	0	3	100	2
AP2291	Educational Tour I[1]	~12 days			50	2
	Sub total	**0**	**0**	**18**	**550**	**14**
TOTAL		**32**			**1000**	**28**

[1]Educational Tour I will be conducted after completion of the B Arch 3rd Semester Examinations and to be completed preferably before the staring of the B Arch Fourth Semester.

Course Structure – Third Year First Semester (5th Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP3101	Evolution of Architecture III	3	0	0	100	3
AP3102	Estimation and Specification	2	0	0	50	2
AP3103	Building Services II: Mechanical Installations	2	0	0	50	2
AP3104	Building Services III: Architectural Acoustics	2	0	0	50	2
CE3117	Design of Steel Structures	3	0	0	100	3
	Sub total	**12**	**0**	**0**	**350**	**12**
Practical Courses						
AP3171	Architectural Design Studio IV	0	0	12	250	8
AP3172	Working Drawing I	0	0	3	100	2
AP3173	Estimation Practice	0	0	3	100	2
	Sub total	**0**	**0**	**18**	**450**	**12**
	TOTAL	**30**			**800**	**24**

Course Structure – Third Year Second Semester (6th Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP3201	Evolution of Architecture IV	3	0	0	100	3
AP3202	Valuation of Real Properties	2	0	0	50	2
AP3203	Energy Efficient Architecture	2	0	0	50	2
AP3204	Disaster Resistant Architecture	3	0	0	100	3
	Sub total	**10**	**0**	**0**	**300**	**10**
Practical Courses						
AP3271	Architectural Design Studio V	0	0	12	250	8
AP3272	Interior Design Practice	0	0	3	100	2
AP3273	Working Drawing II	0	0	3	100	2
CE3287	Structure Project on Analysis and Design of Buildings	0	0	3	100	2
AP3291	Educational Tour II[2]	~ 12 days			50	2
	Sub total	**0**	**0**	**21**	**600**	**16**
TOTAL		**31**			**900**	**26**

[2]Educational Tour II will be conducted after completion of the B Arch 5th Semester Examinations and to be completed preferably before the staring of the B Arch Sixth Semester.

Course Structure – Fourth Year First Semester (7th Sem.)

Course Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP4101	Theories of Architecture	3	0	0	100	3
AP4102	Professional Practice and Entrepreneurship Development	3	0	0	100	3
AP4103	Principles of Human Settlements	3	0	0	100	3
AP4121	Elective I: Departmental	3	0	0	100	3
HU41ZZ	Elective II: Open (HSS)	3	0	0	100	3
	Sub total	**15**	**0**	**0**	**500**	**15**
Practical Courses						
AP4171	Architectural Design Studio VI	0	0	12	300	10
AP4172	Built-environment Monitoring Laboratory	0	0	3	100	2
	Sub total	**0**	**0**	**15**	**400**	**12**
	TOTAL	**30**			**900**	**27**

Course Structure – Fourth Year Second Semester (8th Sem.)

Course Code	Course Title	Contact Periods/ Week	Marks	Credit
Practical Courses				
AP4291	Professional Training	24 weeks duration	100	4
AP4292	Training Report	Examination only	50	2
AP4293	Training Viva-Voce	Examination only	50	2
	TOTAL		**200**	**8**

Course Structure – Fifth Year First Semester (9th Sem.)

Code	Course Title	Contact Periods/ Week			Marks	Credit
Theoretical Courses		**L**	**T**	**S**		
AP5101	Housing	3	0	0	100	3
AP5102	Urban Design and Architectural Conservation	4	0	0	100	4
AP5121	Elective III : Departmental/ Open	3	0	0	100	3
	Sub total	**10**	**0**	**0**	**300**	**10**
Practical Courses						
AP5171	Architectural Design Project	0	0	12	300	10
AP5172	Architectural Thesis Programming	0	0	3	100	2
AP5173	Elective IV : Departmental	0	0	3	100	2
AP5191	Comprehensive Viva-Voce	Examination only			100	2
	Sub total	**0**	**0**	**18**	**600**	**16**
TOTAL		**28**			**900**	**26**

Course Structure – Fifth Year Second Semester (10th Sem.)

Code	Course Title	Contact Periods / Week			Marks	Credit
Practical Courses						
AP5271	Architectural Thesis I	0	0	16	450	12
AP5291	Architectural Thesis II	Examination only			300	8
AP5292	Architectural Thesis Viva-Voce	Examination only			150	4
	TOTAL	0	0	**16**	**900**	**24**

FIRST SEMESTER

AP1101 | Design Fundamentals | 3 credits

Course Duration	Course prerequisite	Contact periods	Full Marks
15 weeks	None	3 lectures per week	100

COURSE OBJECTIVE

The objective of this course is to introduce a fresh student of architecture to the fundamental principles of visual design.

COURSE OUTCOME

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

(i) be able to conceive design as a process,
(ii) have a fair idea regarding the elements and principles of design,
(iii) have knowledge to prepare elementary colour schemes,
(iv) have acquaintance about spatial organization, and
(v) have a reasonable idea about design methodology with particular reference to architecture.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS
1	Introduction to Design	2
2	Contrast	4
3	Figure Organization	6
4	The Idea of Unity	9
5	Colour	6
6	Depth and Plastic Illusion	6
7	Ordering Principles	4
8	Typography	6
9	Design Methodology	2

DETAIL COURSE CONTENT

Module 1 Introduction to Design **2 pds.**

Defining design — Design as a process — Thought process as a design process: Vertical & Lateral

Module 2 Contrast **4 pds.**

2.1 PERCEPTION OF LIGHT: Chroma – Brightness – Hue – Saturation

2.2 PERCEPTION OF REFLECTING SURFACES: Tonal quality: value, hue & intensity – Visual texture

2.3 COMPOSITION: Figure-Ground Relationship – Closure

Module 3 Figure Organization **6 pds.**

3.1 Attraction Value and Attention Value

3.2 ORGANIZATION OF FIGURE ELEMENTS: Spatial basis for grouping and Likeness basis for grouping

3.3 SPATIAL ORGANIZATIONS: Centralized organization, Linear organization, Radial organization, Clustered organization, Grid organization

3.4 Variety in Unity

Module 4 The Idea of Unity **9pds.**

4.1 BACKGROUND OF VISUAL UNITY: Structure of visual field — Eye movements in perception

4.2 QUALITIES OF UNITY: Closed pattern of movement, Balance, Proportional Relationships, Rhythm

4.3 MOVEMENT: Movement in design – Dynamic values in the visual field: Relation of the elements to the field structure, Shape of figure elements, Position of the figure in the ground

4.4 BALANCE: Symmetrical balance (axial and radial) – Occult Balance

4.5 PROPORTION AND RHYTHM: Organic basis of proportion and rhythm – Analysing proportion and rhythm: Simple numerical ratios, Values of the summation series, Geometric Ratios, Dynamic symmetry (golden-mean rectangle, root-five rectangle, root-two rectangle), Intrinsic geometric ratios — RHYTHM: Sequence of progression andalteration, Occult rhythm — Dominance andsub-ordination

Module 5 Colour 6 pds.

5.1 COLOUR CHARACTERISTICS: Transmitted and pigment colour – Additive and subtractive colour mixing – Primaries, secondaries, tertiaries

5.2 COLOUR THEORY:Itten's 12-step colour wheel, Munsell colour system

5.3 PIGMENT AND TONE CONTROL: Tints, Shades, Greyed tones, Complimentaries

5.4 COLOUR SCHEMES:Related (Monochromatic and analogous) – Contrasting (Complementary, Split Complimentary and Triad)

5.5 PHYSIOLOGICAL-PSYCHOLOGICAL BASIS FOR COLOUR RELATIONS: Likeness – Sequence in hue, value and intensity perception – Psychological complements

5.6 SIMULTANEOUS CONTRAST:Value Contrast – Hue Contrast – Intensity Contrast

Module 6 Depth and Plastic Illusion 6pds.

6.1 BASIS OF SPACE ILLUSION: Size cues (Constancy phenomenon) – Space indications (use of line, tone and light)

6.2 INDICATIONS OF DEPTH ON A 2-D PLANE: Contrast and gradation in size, Converging parallels and diagonal action (linear perspectives, metric projections), Position in the picture plane, Overlapping, Diminishing detail, Atmospheric perspective, Advancing and receding colour

6.3 3-D ORGANISATION: Nature of the three-dimensional problem – Closed and open form – Interrelationship between material, structure and form

Module 7 Ordering Principles 4pds.

Axis – Symmetry – Hierarchy – Datum – Rhythm – Repetition – Transformation

Module 8 Typography 6pds.

8.1 STUDY OF TYPOGRAPHY: History, classification, anatomy and usage of various letterforms – Theoreticaland applicable principles of letterforms.

8.2 EXPRESSIVE TYPOGRAPHY: Compositions with type – Typography in different contexts like New media, Posters, Signage, Books,Mailers, Motion graphics etc.

Module 9 Design Methodology 2pds.

Brief – **A**nalysis – **S**ynthesis – **I**mplementation – **C**ommunication & Feedback — Journey from known to unknown

REFERENCE BOOKS

1. Design Fundamentals / Robert Scott
2. Form, Space and Order / Francis D.K. Ching
3. Introduction to Design / Alan Pipes

AP1102 | Materials and Methods of Construction I | 3 credits

Course Duration	Course prerequisite	Contact periods	Full Marks
15 weeks	None	3 lectures per week	100

COURSE OBJECTIVE

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

(i) Familiar with the construction materials, their physical properties and scope of application in real life situation.
(ii) Able to select suitable material for construction- sensible use of earth's resources
(iii) Aware of the associated impacts of using the building construction material.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS
1	Introduction to Buildings	6
2	Masonry	15
3	Mortar and Concrete	24
	Total	**45**

DETAILED COURSE CONTENT

Module 1 Introduction to Buildings 6 pds.

1.1 Need of studying the subject
1.2 Introduction to buildings - foundation, wall and roof; beam, column and slab
1.3 Introduction to building materials - Commonly used and state of the art materials, Futuristic materials, Physical and mechanical properties of materials.

Module 2 Masonry 15 pd.

2.1 Introduction to different types of masonry
2.2 Stone masonry: Building stones- types and properties; Stone masonry
2.3 Brick masonry: Composition of good brick earth; Brick manufacturing process; Brick sizes, classification and properties; Principles in brick masonry construction; Brick bonding - English, Flemish, Rat trap, CBRI etc.
2.4 Other masonry: Mud, adobe, mud block masonry; Aerated Autoclaved Concrete Block masonry; etc.

Module 3 Mortar and concrete 24 pds.

3.1 Introduction to mortar and concrete
3.2 Constituents – binder, fine aggregate, coarse aggregate
3.3 Binders: Lime; Cement - Types of Portland Cement - Pozzolona Cement, White Cement, Blast furnace slag cement, etc.; Storage of cement
3.4 Aggregates: Grading of aggregates–Fine & Coarse aggregate; Types and properties of aggregates
3.5 Mortar: Classification, constituents and applications of Cement mortar; Discussion on properties, constituents and scope of application of: Lime mortar, Mud mortar, Composite mortars (Lime-Cement mortar, Surki-Lime mortar) , Gypsum mortar etc
3.6 Concrete: Properties of concrete: Strength, Durability, Workability; Water-Cement Ratio; Concreting Processes – Batching, Mixing, Transporting, Placing, Compaction, Curing, Finishing; Concrete additives and admixtures; Principal types of concrete construction - Plain Cement Concrete (PCC), Reinforced Cement Concrete (RCC), Pre-cast Concrete, Pre-stressed concrete, Special Concrete; Defects of concrete and their curing measures

REFERENCE READINGS

1. "Brickwork" by John Carruthers, *Butterworth-Heinemann*
2. "Design of Structural Masonry" by W.M.C. McKenzie, *Palgrave*
3. "Timber Designers' Manual" by E. C. Ozelton& J. A. Baird, *Science*
4. "Building Construction Illustrated" By F D.K. Ching, *John Wiley & Sons, Inc*
5. "Building Materials" By S.K. Duggal, *New Age International (P) Limited*
6. "Complete Building Construction" By Mark Miller, Rex Miller, & Eugene Leger., *John Wiley & Sons, Inc*
7. "The Ecology of Building Materials" by Bjorn Berge, *Architectural Press*
8. Building materials by P. C. Varghese, *PHI Learning Pvt. Ltd.*
9. Building construction handbook by Chudley, R., &Greeno, R., *Routledge.*

AP1181 | Basic Design | 4 credits

Course Duration	Course prerequisite	Contact periods	Full Marks
15 weeks	None	6sessional classes per week	150

COURSE OBJECTIVE

The objective of this course is to impart primary design skills to a fresh student of architecture.

COURSE OUTCOME

On successful completion of this course, the students will acquire skills:—

(i) to prepare colour schemes,
(ii) to express tactile feelings through letter forms,
(iii) to undertake simple two-dimensional and three-dimensional compositions, and
(iv) to analyse simple compositions.

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS
1	Colour Schemes	15
2	Tactile Feelings through Letter Forms	12
3	Two Dimensional Compositions	12
4	Three Dimensional Compositions	12
5	Modular Compositions	9
6	Designing Simple Products	21
7	Polyhedra	9

DETAIL COURSE CONTENT

Module 1 Colour Schemes 15pds.

1.1 Representation of the primary, secondary and tertiary colours through colour-wheels, study of tints and shades, andstudy of the hue spectrum.

1.2 Study of related and contrasting colour schemes through simple applications

Module 2 Tactile Feelings through Letter Forms 12 pds.

Expressing basic tactile feelings of materials like hard, fragile, soft, strong, rugged etc. through letter forms

Module 3 Two Dimensional Compositions 12 pds.

Undertaking two-dimensional composition of simple geometric shapes using the principles of contrast

Module 4 Three Dimensional Compositions 12 pds.

Undertaking three-dimensional composition of simple solids using the principles of figure organization

Module 5 Modular Compositions 9 pds.

4.1 Study of different compositions based on geometric ratios and proportions like metallic ratios, root rectangles, star polygons etc.

4.2 Study of tessellations

Module 6 Designing Simple Products 21 pds.

Undertaking designing of asimple product like album cover, book cover, brochure, CD cover, logo, mural, poster, stamp and first day cover, etc. along with analysis of organization of figure elements, qualities of visual unity, and colour scheme

Module 7 Polyhedra **9pds.**

Making paper models of polyhedron applying the principles of surface development

REFERENCE BOOKS

1. Design Fundamentals / Robert Scott
2. Form, Space and Order / Francis D.K. Ching
3. Introduction to Design / Alan Pipes

AP 1182 | Descriptive Geometry I | 4 credits

Course Duration	Course prerequisite	Contact periods	Full Marks
15 weeks	None	6Sessional Classes Per week	150

COURSE OBJECTIVE

To introduce the basic tools, techniques and fundamental principles of Engineering Drawing to the first semester students of Architecture.

COURSE OUTCOME

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

(i) be able to conceive three dimensional objects in two-dimensional plane.
(ii) have a fair knowledge regarding the basic tools and techniques used in Architectural Drawings.
(iii) have a fair idea to represent a three-dimensional object through plans, elevations and sections in cartesian system

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS
1	Introduction	3
2	Types of lines used in Engineering Drawing	6
3	Concept of Scale	6
4	Orthographic Projection	24
5	Section of Solids	12
6	Surface Development	15
7	Intersection of Surfaces	18

DETAIL COURSE CONTENT

Module 1 Introduction **3pds.**

Introduction to Engineering Drawing and Descriptive Geometry; Introduction to the drawing instruments and their use

Module 2 Lettering and Dimensioning Practices **6 pds.**

2.1 Lines (IS 10714 (Part 20): 2001 and SP 46: 2003)

2.2 Lettering [IS 9609 (Part 0) : 2001 and SP 46: 2003]

2.3 Importance of Lettering, Single Stroke Letters, Types of Single Stroke Letters, Size of Letters, Procedure for Lettering, Lettering Practice.

2.4 Dimensioning, Principles of Dimensioning, Execution of Dimensions, Methods of Indicating Dimensions, Arrangement of Dimensions.

Module 3 Concept of Scale **6 pds.**

3.1 Reducing and Enlarging Scales

3.2 Concept of Representative Fraction

3.3 Types of Scales- Plain Scale; Diagonal Scale; Vernier Scale

3.4 Scales generally used forArchitectural and Engineering Drawing

3.5 Concept of Diagonal Scale

Module 4 Orthographic Projections 24pds.

4.1 Planes of Projection

4.2 Concept of 1st angle and 3rd angle projection

4.3 ISI code of practice

4.4 Projection of straight line, lamina and solid

Module 5 Section of Solids 12pds.

5.1 True shape of a section

5.2 Principle Plane; Auxiliary Plane

5.3 Section of solid figures

Module 6 Surface Development 15 pds.

6.1 Principal Developments

6.2 Parallel line developments and Radial Developments

6.3 Model making

Module 7 Intersection of Surfaces 18pds.

7.1 Line of intersection

7.2 Methods of determining the line of intersection between surfaces of two interpenetrating solids – Line method; Cutting plane method

7.3 Model making

REFERENCE BOOKS

1. N. D. Bhatt, Engineering Drawing [Plane and Solid Geometry], Charotar Publishing House
2. K. Venugopal, Engineering Drawing and Graphics, New Age International (P) Ltd., publishers, 2000.

SECOND SEMESTER

AP1201 | Materials and Methods of Construction II | 3 credits

Course Duration	Course prerequisite	Contact periods	Full Marks
15 weeks	None	3 lectures per week	100

COURSE OBJECTIVE

The objective of this course is to teach the students about common building materials and components.

COURSE OUTCOME

On successful completion of this course, the students will be able:

(i) to suggest usage of material such as metals, glass, plastic, adhesive etc.
(ii) to understand functions and details of spanning over opening, door, window, hardware etc
(iii) to propose combinations of the above mentioned materials and elements for a building

MODULAR DIVISION OF THE SYLLABUS

MODULE	TOPIC	LECTURE PERIODS
1	Timber	3
2	Metals	6
3	Glass	3
4	Openings	18
5	Foundations	15

DETAIL COURSE CONTENT

Module 1 Timber **3pds**

1.1 Structure and classification of timber
1.2 Timber products – Veneer, Plywood, Laminated board, Block board, Batten board, Composite board, Fibreboard, Particleboard, Engineered wood, MDF and HDF, Engineered Bamboo.

Module 2 Metals **6pds.**

2.1 General characteristics of metals – Ductility, Elasticity, Malleability, Toughness, Weldability
2.2 Properties & uses of ferrous metals – Pig Iron, Cast Iron, Wrought Iron, Mild Steel, Alloy steel (hard steel); Reinforcement Bars – Corrosion Protection
2.3 Non-ferrous Metals (Aluminium, Copper, etc. and their alloys) - Properties, finishes, uses in buildings

Module 3 Glass **3pds.**

3.1 Principal constituents of glass
3.2 Types of glass— properties & uses

Module 4 Openings **18pds.**

4.1 Spanning: Corbels, Lintels and Arches; Typical detail of a masonry window opening showing sill, lintel & chajja projection; Lintel types by construction methods: Brick lintel, RCC lintel (precast & in-situ); Typical details of an arch opening with nomenclature; Types of Arches - Semi-circular, Segmental, Flat , Relieving arch etc.
4.2 Doors and Windows
4.2.1 Timber doors and windows
4.2.2 Steel doors and windows
4.2.3 Aluminium doors and windows
4.2.4 Other doors and windows

4.2.5 Fitting Hardware

15pds.

Module 5 Foundations

5.1 Purpose; Essential requirements; Settlement

5.2 Classification – Shallow (Wall footings, Inverted arch foundation, Isolated footings, Combined footing, Strip footing, Cantilever footing, Mat or raft foundation) - Deep: (Pile foundation, Pier foundation)

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4. Jain, A. K. & Jain A.K. (2016). Building construction- 11th ed., *Laxmi Publications.*
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