GOVT. OF RAJASTHAN

BOARD OF TECHNICAL EDUCATION, JODHPUR

TEACHING AND EXAMINATION SCHEME

(SEMESTER SCHEME-2023-24)

FOR DIPLOMA **III SEMESTER (ARCHITECTURE)(AC)**

SESSION 2023-2024 & ONWARDS

Subject Category	Subject Code	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks	Credits
			Hours per week				End Semester Exam				Internal Assessment				
			L	T	P	Total	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)		
PC	#AC 3001	History of Architecture - I	2	1	--	3	60	3	--	--	20	20	--	100	3
PC	#AC 3002	Theory of Design	2	1	--	3	60	3	--	--	20	20	--	100	3
BS&AE	AC 3003	Building Construction Studio -I	--	--	4	4			40	3	--	--	60	100	2
BS&AE	#AC 3004	Building Materials	1	1	--	2	60	3	--	--	20	20	--	100	2
BS&AE	#AC 3005	Surveying & Levelling	1	--	--	1	60	3	--	--	20	20	--	100	1
PC	AC 3006	Architecture Design Studio – I	--	--	6	6	--	--	40	6	--	--	60	100	3
PC	#AC 3007	Graphical Presentation- I Lab	--	--	4	4	--	--	40	3	--	--	60	100	2
BS&AE	#AC 3008	Surveying & Levelling- Lab	--	--	4	4	--	--	40	3	--	--	60	100	2
PAEC	#AC 3009	Summer Internship – I (4 weeks after II Sem)	--	--	--	--	--	--	100	--	--	--	--	100	2
SEC	AC 3010	Computer Studio-I	--	--	4	4	--	--	40	3	--	--	60	100	2
		Student Centered Activities	2	--	--	2	--	--	--	--	--	--	--	--	--
		Total	8	3	22	33	240	--	260	--	80	80	300	1000	22
													Grand Total :	1000	22

1 L : Lecture

2 T : Tutorial

3 P : Practical

4 TH : Marks for End Semester Exam for Theory

5 PR : Marks for End Semester Exam for Practical

6 CT : Marks for class tests (Internal Assessment)

7 TU : Marks for tutorials (Internal Assessment)

8 PR(S) : Marks for practical and viva (Internal Assessment)

Student Centered Activities include 1. Expert lectures/ practice sessions on technical topics of common interest 2. Personality development 3. Human values 4. Industrial visits 5. Art of living 6.

AR3001,AR3002,AR3004,AR3005,AR3007,AR3008,AR3009 are same as AC3001,AC3002,AC3004,AC3005,AC3007,AC3008,AC3009 respectively.

BS & AE: Building Science & Applied Engineering

PC: Professional Core

SEC: Skill Enhancement Course

OE: Open Elective

PE: Professional Elective

PAEC: Professinal Ability Enhancement Course

GOVT. OF RAJASTHAN

BOARD OF TECHNICAL EDUCATION, JODHPUR

TEACHING AND EXAMINATION SCHEME

(SEMESTER SCHEME-2023-24)

FOR DIPLOMA IV **SEMESTER (ARCHITECTURE)(AC)**

SESSION 2023-2024 & ONWARDS

Subject Category	Subject Code	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks	Credits
			Hours per week				End Semester Exam				Internal Assessment				
			L	T	P	Total	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)		
PC	#AC 4001	History of Architecture– II	2	1	--	3	60	3	--	--	20	20	--	100	3
PC	AC 4002	Estimating & Specifications	2	1	--	3	60	3	--	--	20	20	--	100	3
BS&AE	AC 4003	Building Construction – II	1	1	--	2	60	3	--	--	20	20	--	100	2
PE	#AC 4004	**Professional Elective-I** AC 40041 – Mechanics of Structures AC 40042- Climatology	3	--	--	3	60	3	--	--	20	20	--	100	3
SEC	AC 4005	Building Information Modelling	1	2	--	3	60	3	--	--	20	20	--	100	3
PC	AC 4006	Architecture Design Studio – II	--	--	6	6	--	--	40	6	--	--	60	100	3
PC	#AC 4007	Graphical presentation-II Lab	--	--	4	4	--	--	40	3	--	--	60	100	2
PAEC	#AC 4008	Minor Project	--	--	4	4	--	--	40	3	--	--	60	100	2
BSAE	AC 4009	Building Construction Studio -II	--	--	4	4	--	--	40	3	--	--	60	100	2
VS	*AC 4222	Essence of Indian Knowledge & Tradition	2	--	--	2	--	--	--	--	--	--	--	--	--
		Total	11	5	18	34	300	--	160	--	100	100	240	900	23
													Grand Total :	900	23

1 L : Lecture
2 T : Tutorial
3 P : Practical
4 TH : Marks for End Semester Exam for Theory
5 PR : Marks for End Semester Exam for Practical
6 CT : Marks for class tests (Internal Assessment)
7 TU : Marks for tutorials (Internal Assessment)
8 PR(S) : Marks for practical and viva (Internal Assessment)

1. Students will go for 6 Weeks Summer Internship in the Summer Vacations after Fourth Semester. The assessment of the Summer Internship will be done in Fifth Semester

*** Note: AC 4222 IS SAME FOR ALL BRANCEHES OF ENGINEERING**

AR4001,AR4002,AR4004,AR4007,AR4008,AR4222 are same as AC4001,AC4002,AC4004,AC4007,AC4008,AC4222 respectively.

GOVT. OF RAJASTHAN
BOARD OF TECHNICAL EDUCATION, JODHPUR
TEACHING AND EXAMINATION SCHEME
(SEMESTER SCHEME-2023-24)
FOR DIPLOMA V **SEMESTER (ARCHITECTURE)(AC)**
SESSION 2023-2024 & ONWARDS

Subject Category	Code No.	Subjects	Distribution of Time (Hours per week) L	T	P	Tot	Distribution of Max. Marks/ Duration: End Semester Exam TH	Hrs.	PR	Hrs.	Internal Assessment CT	TU	PR(S)	Total Marks	Credits
BS&AE	#AC 5001	Building Services & drawing	2	1	--	3	60	3	--		20	20	--	100	3
PC	#AC 5002	Building bye laws & Municipal drawings	2	1	--	3	60	3	--	--	20	20	--	100	3
OE	#AC 5100	**Open Elective –I** +AC 51001- Economic Policies in India +AC 51002- Engineering Economics & Accountancy.	3	--	--	3	60	3	--	--	20	20	--	100	3
BS&AE	AC 5003	Building construction - III	1	1	--	2	60	3	--	--	20	20	40	100	2
PE	#AC 5004	**Professional Elective – II** **AC 50041-Green Building & Energy Conservation *AC 50042- Advanced Construction Technology	3	--	--	3	60	3	--	--	20	20	--	100	3
PE	#AC 5005	**Professional Elective – III** AC 50051 – Structural Drawing & Detailing AC 50052 – Town Planning & Landscape Design	3	--	--	3	60	3	--	--	20	20	--	100	3
PC	AC 5006	Architecture Design Studio – III Studio	--	--	6	6	--	--	40	--	--	--	60	100	3
PEC	#AC 5007	Summer Internship-II (6 week after IV Sem)	--	--	--	--	--	--	100	--	--	--	--	100	3
PEC	#AC 5008	Major Project	--	--	2	2	--	--	--		--	--	--	--	
BS&AE	AC 5009	Building Construction Studio – III Studio	--	--	4	4	--	--	40	3	--	--	60	100	2
		Student Centered Activities	3	--	--	3	--	--	--	3	--	--	--	--	
		Total	17	3	12	32			180	--	120	120	160	900	25
												Grand Total :		900	25

1 L : Lecture
2 T : Tutorial
3 P : Practical
4 TH : Marks for End Semester Exam for Theory
5 PR : Marks for End Semester Exam for Practical
6 CT : Marks for class tests (Internal Assessment)
7 TU : Marks for tutorials (Internal Assessment)
8 PR(S) : Marks for practical and viva (Internal Assessment)

1. +AC51001, + AC 51002 are same in all branches of engineering.

2. ** AC 50041 is same as AR/CC/CE/CV 50041

3. * AC 50042 is same as AR/CE 50042

4. # AR5001,AR5002,AR5100,AR5004,AR5005,AR5007,AR5008 are same as AC5001,AC5002,AR5100,AC5004,AC5007,AC5008 respectively.

Student Centric Activities will be graded as A, B, C & D on the basis of drawing work to be conducted as per subject code AC 5002

: Major project will be continued & assessed in VI semester.

GOVT. OF RAJASTHAN

BOARD OF TECHNICAL EDUCATION, JODHPUR

TEACHING AND EXAMINATION SCHEME

(SEMESTER SCHEME-2023-24)

FOR DIPLOMA VI **SEMESTER (ARCHITECTURE)(AC)**

SESSION 2023-2024 & ONWARDS

Subject Category	Code No.	Subjects	Distribution of Time (Hours per week) L	T	P	Tot	Distribution of Max. Marks/ Duration: End Semester Exam TH	Hrs.	PR	Hrs.	Internal Assessment CT	TU	PR(S)	Total Marks	Credits
HS	+AC 6111	Entrepreneurship and Start-ups	3	1	--	4	60	3	--	--	20	20	--	100	4
PE	*AC 6200	**Open Elective- II** *AC 62001- Project managment *AC 62002 –Renewable Energy technologies	3	--	--	3	60	3	--	--	20	20	--	100	3
OE	+AC 6300	**Open Elective III** +AC 63001- Product design +AC 63002-Disater Management	3	--	--	3	60	3	--	--	20	20	--	100	3
OE	+AC 6333	+Indian Constitution	1	--	--	1	--	--	--		--	--	--	--	--
PE	#AC 6001	**Programme Elective IV** AC 60011- Electrical, HVAC, Fire Safety & Building Automation AC60012-Construction Project Management	3	--	--	3	60	3	--	--	20	20	--	100	3
PC	#AC 6002	Working drawing & detailing Lab	--	--	4	4	--	--	40	6	--	--	60	100	2
PC	#AC 6003	Architecture Design - IV Lab	--	--	4	4	--	--	40	6	--	--	60	100	2
PAEC	#AC 6004	Major Project	--	--	6	6	--	--	40	6	--	--	60	100	4
PAEC	#AC 6005	Seminar	1	--	--	1	--	--	--	3	--	--	100	100	1
PE	AC 6006	**Programme Elective V** AC60061- Professional Practice Code AC60062-Vernacular Architetcure	1	1	--	2	60	3	--	--	20	20	--	100	2
		Total	15	2	14	31	300	--	120	--	100	100	280	900	24
													Grand Total :	900	

1 L : Lecture
2 T : Tutorial
3 P : Practical
4 TH : Marks for End Semester Exam for Theory
5 PR : Marks for End Semester Exam for Practical
6 CT : Marks for class tests (Internal Assessment)
7 TU : Marks for tutorials (Internal Assessment)
8 PR(S) : Marks for practical and viva (Internal Assessment)

1. +AC 6111, + AC 62001, +AC 62002, + AC63001 , +AC 63002 & AC 6333 are same in all branches of engineering.

2.# AR6001,AR6002,AR6003,AR6004,AR6005 are same as AC6001,AC36002,AC6003,AC6004 & AC6005 respectively.

HISTORY OF ARCHITECTURE – I

Course Code	AC 3001
Course Title	HISTORY OF ARCHITECTURE – I
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

India has a vast variety of architecture. The evaluation, development and growth of architecture in India play very important role. The student must be acquainted with the history of Indian Architecture. After study of the subject; the students will have a wide scope of development in this field.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand the glorious history of ancient construction techniques & aesthetics of ancient Indian temples.
2. Identify construction materials available during that period & their use in Hindu temples.
3. Identify various developmental phases & components of Hindu temples across the country.
4. Compare the formulation & identify the chronological development of various styles of Hindu temple.

CONTENTS

1. Temple Architecture in India :- Emphasis on evolution, siting concept plans, elevation, sections, materials and construction :

1.1 Dravidian style

- 1.1.1 Pallavas
- 1.1.2 Cholas
- 1.1.3 Pandyas
- 1.1.4 Vijaynagar
- 1.1.5 Madurai

1.2 Indo – Aryan Style

- 1.2.1 Khajuraho
- 1.2.2 Orrissa

1.3 Chalukyan Styles

- 1.3.1 Aihole
- 1.3.2 Badami
- 1.3.3 Pattadakal

REFERENCE BOOKS :

1. Changing ideals of modern Architecture — Peter Collins
2. Modern movement in Architecture — Rovner Benham
3. Towards a new Architecture — Walter Gropious
4. History of Architecture (Indian) — Percy Brown
5. History of Indian and for Eastern Architecture — Rergersam
6. Indian Architecture — Havet
7. History of Architecture — B. Fletcher
8. City in History — Lewis Mumford

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THEORY OF DESIGN

Course Code	AC 3002
Course Title	THEORY OF DESIGN
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

Students of Architecture at diploma level are supposed to understand basic principles of theory of design while designing some building. All students should know the balance, light and shadow, shapes, plan, volume, line, Proportions, rhythm, emphasis, contrast, colour and other related elements.

Therefore, the subject of theory of design is very important for students undergoing diploma course in Architecture because it is the basis of Architecture designing.

Teachers while imparting instruction are expected to teach various elements used in building design. Teachers may make use of models and audio- Visual aids to clarify the concepts. Group discussions and seminars may also be organized to discuss various concepts the principals involved in the design. It is recommended that teachers may organize visits to historical buildings, and selected modern building highlighting the concepts of Architecture design.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Analyze & describe the built environment using terminology of basic design principals.
2. Apply basic design principals to create spatial solutions in future courses & projects.

CONTENTS

Definition examples and applications of the following:

1. Primary Elements of Design:

1.1 Point
1.2 Line
1.3 Plane
1.4 Volume

2. Design Elements:

2.1 Composition:

2.1.1 Shape
2.1.2 Size
2.1.3 Form
2.1.4 Function

2.2 Balance :

2.2.1 Symmetry and stability
2.2.2 Formal Balance and Informal Balance

2.3 Texture :

2.3.1 Surface Quality
2.3.2 Light and Structure

2.4 Pattern
2.5 Contrast:

2.5.1 Light and shade

2.5.2 Nature and man made

2.6 Scale :

2.6.1 Monumental scale
2.6.2 Human scale
2.6.3 Intimate scale

2.7 Colour :

2.7.1 Effect of colour
2.7.2 Colour chart

2.8 Circulation: - Vertical circulation and Horizontal circulation in public buildings, B.S.I. standard on circulation for residential, commercials and institutional buildings.

REFERENCE BOOKS:

1. Architecture – Space and Order — Francis, D.K.Ching
2. Design — Philip Rawson
3. Abstract Concepts of Drawing — Robert Paterson
4. National Building Code

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BUILDING CONSTRUCTION STUDIO - I

Course Code	AC 3003
Course Title	BUILDING CONSTRUCTION STUDIO – I
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Architectural design after this conceptual stage under goes working stage, for thorough knowledge of building components and their detailing is essential for a student, therefor of building construction subject is must for any architectural students.

Teachers while imparting instructions are expected to show various components of building under construction, make use of models or other audio – visual to clarity the concepts while preparing drawings. Teacher should lay considerable stress on proportioning, dimensioning, specification writing, and printing and composition of drawing work.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Identify the factors to be considered in construction of buildings and develop the construction practices and techniques.
2. Identify, analyze and implement deep and shallow foundations.
3. Identify and select appropriate openings, DPC, lifts escalators and different staircases

CONTENTS

1. Brick Work and Stone Work:

1.1 Definition and terms
1.2 Masonry classification
1.3 General principles in brick construction
1.4 Bonds in brick masonry
1.5 Brick Jallies
1.6 Dressings of stone
1.7 Stone claddings
1.8 Comparison between brick masonry and stone masonry

2. Opening in Walls:

2.1 Arches

2.1.1 Technical terms in arch work
2.1.2 Types of arches
2.1.3 Methods of construction (material used) of arch

2.2 Lintels

2.2.1 Classification of lintels of different material
2.2.2 Types of lintels

3. Foundations:

3.1 Types of foundations (Method of construction and merit, demerits)

3.1.1 Open foundations/ Shallow foundations

3.1.2 Raft foundation
3.1.3 Deep foundation

4. Damp Proof course:

4.1 Source of dampness
4.2 Effects of dampness
4.3 Techniques and methods of damp prevention
4.4 Materials used for damp proofing course (D.P.C.)
4.5 Damp proof treatment in buildings

5. Timber Joints:

5.1 Difference in carpentry and joinery
5.2 Technical terms of joinery
5.3 General principles of construction joints
5.4 Types of joints
5.5 Fastenings- their types, basic objects, important features

6. Wooden Doors and Windows:

6.1 General terms and definition of technical terms.
6.2 Definition of Doors, Windows and Ventilators and their location.
6.3 Type of Doors.
6.4 Type of Windows and Ventilators and their functional use

PRACTICAL

1. Brick types, Brick bond, jalli and stone masonry. (2 Sheet)
2. Reinforced brickwork. (1 Sheet)
3. Drawing of lintels and arches in various materials. (1 Sheet)
4. Drawing of spread foundation and application of DPC on spread foundation and basements. (1 Sheet)
5. Timber joints. (1 Sheet)
6. Wooden Doors. (2 Sheet)
7. Wooden Windows and Ventilators. (2 Sheet)

REFERENCE BOOKS:

1.	Building Construction	B.C. Punmia
2.	Building Construction	Sushil kumar
3.	Building construction	Arora & Bindra
4.	Building construction (Hindi)	Gurcharan Singh
4.	Building Construction (Vol. I – V)	W. B. Mackey
5.	Best of Architects Working Detail 1and 2	Colin Boyne & Lanes Wrikhs

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BUILDING MATERIALS

Course Code	AC 3004
Course Title	BUILDING MATERIALS
Number of Credits	2 (L: 1, T: 1, P: 0)
Course Category	BS&AE
Prerequisites	NILL

RATIONALE

Knowledge, of various building material in term of their availability, size, types and uses in the utmost importance for Architecture student (without manufacturing Process). The subject of Construction Materials imparts knowledge of students and enables them to explain different material to the maximum.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Select appropriate materials for construction of buildings.
2. Assess various precautionary measures pertaining to construction materials.
3. Define engineering principles relevant to building materials.

CONTENTS

1. Stone:
- 1.1 Characteristics and identification and quality of good building stone.
- 1.2 Description of granites, basalt, sand stone, lime stone, marble slate.

2. Bricks:
- 2.1 Classification of bricks (Manufacturing Process not required)
- 2.2 Composition

3. Lime:
- 3.1 Types of lime
- 3.2 Uses of lime

4. Cement:
- 4.1 Types of cement
- 4.2 Properties and uses of cement

5. Paints:
- 5.1 Water based Paints
- 5.2 Cement Paints, Emulsion, Dry distemper
- 5.3 Oil paints
- 5.4 Varnishes, Enamels, Lacquer, and Stucco.

6. Floor Tiles:
- 6.1 Different types of tiles and its classification
- 6.2 Sizes of tiles
- 6.3 Uses of tiles

7. Glass:
- 7.1 Types of glass
- 7.2 Thickness of glass and their uses

8. Timber:
- 8.1 Classification of Timber.
- 8.2 Defects in Timber.
- 8.3 Uses of wood products.

REFERENCE BOOKS :

1. Building Materials Sushil Kumar

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SURVEYING AND LEVELLING

Course Code	AC 3005
Course Title	SURVEYING AND LEVELLING
Number of Credits	1(L: 1, T: 0, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

The important function of diploma student includes deal with various surveying instruments and their use in field of Architecture, such as chain surveying, levelling, contouring, so it is required to study for Architecture diploma students of surveying and leveling.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Provide knowledge and develop skills of different surveying instruments.
2. Develop ability to solve surveying engineering problems in practice by applying fundamental knowledge of mathematics, science and by using modern surveying engineering techniques, skills and tools.
3. Adopt appropriate survey method for field problem.

CONTENTS

1. Introduction :

1.1 Plane Surveying and geodetic surveying
1.2 Use of surveying in engineering
1.3 Principle of surveying

2. Chain Surveying :

2.1 Different types of chains

- 2.1.1 Metric chain
- 2.1.2 Engineers chain
- 2.1.3 Guntour's chain
- 2.1.4 Revenue chain

2.2 Types of tapes

- 2.2.1 Linen tape
- 2.2.2 Metallic tape
- 2.2.3 Invar tape
- 2.2.4 Steel Bard tape

2.3 Ranging rod
2.4 Off set rod
2.5 Line ranger
2.6 Cross staff
2.7 Optical square
2.8 Arrow
2.9 Folding, unfolding of chains
2.10 Testing and adjusting of chain
2.11 Ranging

- 2.11.1 Direct ranging
- 2.11.2 Indirect ranging

2.12 Chaining on plane ground
2.13 Conventional signs in surveying
2.14 Recording in field book
2.15 Chaining on sloping ground
2.16 Common errors and precautions
2.17 Traversing
2.18 Fixing and marking stations
2.19 Common obstacles in chaining

3. Levelling :

3.1 Definitions
3.2 Names and function of different parts of

3.2.1 Dumpy level
3.2.2 Tilting level

3.3 Temporary adjustment of dumpy and tilting level
3.4 Levelling staff

3.4.1 Self reading
3.4.2 Telescopic staff
3.4.3 Target staff

3.5 Levelling with dumpy and tilting level
3.6 Calculation of R.L.

3.6.1 H.I. method
3.6.2 Rise and fall method
3.6.3 Arithmetic check

3.7 Different type of levelling
3.8 Effect of curvature and refraction

4. Contours :

4.1 Concept
4.2 Purpose of contouring
4.3 Factor affecting contour interval
4.4 Characteristics of contour
4.5 Use of contour map
4.6 Drawing cross- section from contour maps

5. Plane Table Surveying :

5.1 Description and uses of plane table
5.2 Advantage of plane table
5.3 Centering, levelling and orientation of plane table
5.4 Radiation
5.5 Intersection
5.6 Traversing

REFERENCE BOOKS :

1. Surveying B.C. Punmia
2. Surveying G.C. Singh
3. Surveying K.R. Arora

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ARCHITECTURE DESIGN STUDIO – I

Course Code	AC 3006
Course Title	ARCHITECTURE DESIGN STUDIO – I
Number of Credits	3 (L: 0, T: 0, P: 6)
Course Category	PC
Prerequisites	NIL

RATIONALE

Large percentage of diploma holders in Architecture find employment with Private Architects and also majority of them go for self employment therefore diploma holder are required to design small residential and public buildings. These course aims at providing practical exercises in designing so as to develop appropriate knowledge and skills in building design.

Teachers are expected to show various types of designs of small to medium residential building to develop an appreciation of different designs. Teachers should also motivate student to maintain their sketchbook in which they draw line and sketch of different architectural styles.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand & use the theory & develop concepts to use methods of planning.
2. Arrange areas, furniture and material choice in a justified manner.
3. Learn by solving small design problems with drawing sets.

CONTENTS

1. Form Composition :

1.1 Composition of three dimensional geometrical forms
1.2 Composition with relation to Plan, Elevation & Section.

2. Study Of Anthropometric and Design Standards:

2.1 Anthropometric study of human figures.
2.2 Minimum standard areas in a living unit and furniture dimensions.
2.3 Circulations and furniture layout in drawing room, dinning, bedroom, kitchen, toilet etc

3. Design of a Residence.

3.1 Application of anthropometry in design of simple living and working spaces through study of furniture and clearances in space.
All Studies to be made through Plans :

3.2 Assembly of group of such units under one roof and keeping the circulation space minimum and with respect to orientation.
All Studies to be made through Plans, elevations &sections :

3.3 Design of Three bedroom detached residence:

3.3.1 Plans
3.3.2 Sections
3.3.3 Elevations

REFERENCE BOOKS :

1. National Building code of India 1983

2. Neufert Architect Data. M.G. Shah
3. Building Drawing Kale and Patki
4. Time Saver Standards (Building Type)
5. Architectural Magazines published time to time

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GRAPHICAL PRESENTATION - I LAB

Course Code	AC 3007
Course Title	GRAPHICAL PRESENTATION - I LAB
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	PC
Prerequisites	NIL

RATIONALE

Graphical Presentation forms a core subject for developing the presentation skill graphically. During the course the students must develop the skill of rendering in various mediums i.e. pencil, colors etc.

The student must be skillful in free hand sketching.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Acquaint with the principals of graphical techniques to represent object in projection drawings.
2. Understand the color concepts, color schemes & represent in art form presentation.
3. Sketch events & places by watching & memorizing with various representative mediums.

CONTENTS

1. Introduction to drawing equipments and drafting standards used for graphical presentation.
2. Effect of lines by intensity variation and different mediums i.e. pen ink etc.
3. Methods of subdivision of lines
4. Isometric & Axonometric View of simple geometrical forms

    4.1 Cube
    4.2 Cylinder
    4.3 Cone
    4.4 Pyramid.
    4.5 Prism

5. Isometric view of complex geometrical forms

6. Introduction of free hand sketching as a regular exercise of landscape, trees, street views etc (A regular record of free hand sketching in the sketch book is to be maintained by the students)

7. **Free hand sketching: Free hand sketching of simple three dimensional geometrical objects, buildings & Landscape:**

    7.1 Free hand sketching of Cube
    7.2 Free hand sketching of Cone
    7.3 Free hand sketching of Prism
    7.4 Free hand sketching of Cylinder
    7.5 Free hand sketching of Sphere
    7.6 Free hand sketching of Building
    7.7 Free hand sketching of landscape

8. **Coloring and Rendering: - Definition and perception of colour and colour materials:**

    8.1 Hue, value and intensity scale
    8.2 Colour wheel
    8.3 Warm and cool colour

9. **Introduction to:**

9.1 Mural
9.2 Collage
9.3 Sculpture
9.4 Painting

PRACTICALS

1.	Line drawing in pencil showing intensity variations	1 sheet
2.	Line drawing in ink showing intensity variations	1 sheet
3.	Subdivision of lines	1 sheet
4.	Isometric view of simple geometrical forms	1 sheets
5.	Axonometric view of simple geometrical forms	1 sheets
6.	Isometric view of complex geometrical forms	2 sheets
7.	Free hand drawing of three-dimensional geometrical objects. viz. cube, cone, prism , cylinder	1 sheets
8.	Free hand sketching of complex geometrical forms	1 sheets
9.	Exercise on mural design	1 sheet
10.	Exercise on collage design	1 sheet
11.	Free hand sketching in sketchbook - Minimum three sketches per week. (The students are required to maintain a sketchbook)	

REFERENCE BOOKS :

1. Rendering with pen and ink
2. Architectural rendering — Albert Halse
3. Graphic Arts. — Earm A dennis.
4. Engineering drawing — Gurucharan Singh

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SURVEYING AND LEVELLING LAB

Course Code	AC 3008
Course Title	SURVEYING AND LEVELLING LAB
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	BS&AE
Prerequisites	NILL

RATIONALE

The important function of diploma student includes to deal with various surveying instruments and their use in field of Architecture, such as chain surveying, levelling, and contouring, so it is required to study for Architecture diploma students of surveying and leveling.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Provide knowledge and develop skills of different surveying instruments.
2. Develop ability to solve surveying engineering problems in practice by applying fundamental knowledge of mathematics, science and by using modern surveying engineering techniques, skills and tools.
3. Adopt appropriate survey method for field problem.

CONTENTS

1. Introduction :

1.1 Plane Surveying and geodetic surveying
1.2 Use of surveying in engineering
1.3 Principle of surveying

2. Chain Surveying :

2.1 Different types of chains

- 2.1.1 Metric chain
- 2.1.2 Engineers chain
- 2.1.3 Guntour's chain
- 2.1.4 Revenue chain

2.2 Types of tapes

- 2.2.1 Linen tape
- 2.2.2 Metallic tape
- 2.2.3 Invar tape
- 2.2.4 Steel Bard tape

2.3 Ranging rod
2.4 Off set rod
2.5 Line ranger
2.6 Cross staff
2.7 Optical square
2.8 Arrow
2.9 Folding, unfolding of chains
2.10 Testing and adjusting of chain
2.11 Ranging

- 2.11.1 Direct ranging

2.11.2 Indirect ranging

2.12 Chaining on plane ground
2.13 Conventional signs in surveying
2.14 Recording in field book
2.15 Chaining on sloping ground
2.16 Common errors and precautions
2.17 Traversing
2.18 Fixing and marking stations
2.19 Common obstacles in chaining

3. LEVELLING :

3.1 Definitions
3.2 Names and function of different parts of

3.2.1 Dumpy level
3.2.2 Tilting level

3.3 Temporary adjustment of dumpy and tilting level
3.4 Levelling staff

3.4.1 Self reading
3.4.2 Telescopic staff
3.4.3 Target staff

3.5 Levelling with dumpy and tilting level
3.6 Calculation of R.L.

3.6.1 H.I. method
3.6.2 Rise and fall method
3.6.3 Arithmetic check

3.7 Different type of levelling
3.8 Effect of curvature and refraction

4. Contours :

4.1 Concept
4.2 Purpose of contouring
4.3 Factor affecting contour interval
4.4 Characteristics of contour
4.5 Use of contour map
4.6 Drawing cross- section from contour maps

5. Plane Table Surveying :

5.1 Description and uses of plane table
5.2 Advantage of plane table
5.3 Centering, levelling and orientation of plane table
5.4 Radiation
5.5 Intersection
5.6 Traversing

PRACTICALS

1. Study of different chain and tape
2. Chain surveying of small areas
3. Exercise on simple and differential levelling
4. Preparation of a plan of an area by plane table
5. Drawing of x-section of given contour maps
6. Preparation of a contoured plan with the level

REFERENCE BOOKS :

1. Surveying B.C. Punmia
2. Surveying G.C. Singh
3. Surveying K.R. Arora

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COMPUTER STUDIO – I

Course Code	AC 3010
Course Title	COMPUTER STUDIO-I
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	SEC
Prerequisites	NILL

RATIONALE

In the 21st century, CAD has become an indispensable tool in many architectural offices. CAD has become a quicker and pragmatic solution to drafting and drawing problems. Hence it becomes necessary for the students of Architecture to have the knowledge and understanding of the concepts of C. A. D.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand AutoCAD to design a variety of structures ranging from commercial buildings to homes.
2. Secure Freelance Work for an AUTOCAD design professional.
3. Become an in-demand professional in the 3D printing industry.

CONTENTS

1-INTRODUTION, DRAWSETTING & CONDITION: Coordinate System, User interface, Basic settings, Navigation bar, Scroll wheel, Viewport, Units, Limits, UCS icon Function keys & its work.

2-DRAWING TOOLS: Line, poly line, Circle, arc Rectangle, polygon Ellipse, Elliptical arc, spine, X line, Ray, Points, Measure, Divide, Region, Wipeout, Helix, Donut, Revision cloud, hatch, Gradient.

3- MODIFY TOOLS: Move, copy, Rotate, scale, Stretch, fillet, chamfer, Erase, offset, explode, Array, polar Array, path array, Trim, extend, mirror, poly line edit, Spine edit, hatch edit, array edit, break, joint, overkill, lengthen.

4-TEXT, TABLE & LAYERS:- Text style, single text, multi text, Table style, create table, Table Edit, text placement, Create layers, Edit layers, layer properties, Layer control (hide, freeze, lock Layout lock, print lock).

5–DIMENTIONING & MULTILEADER: dimension setting, Annotations Dimensions, Linear dimension, Aligned dimension Angular dimensions, arc length, Radius Diameter, ordinates, jogged Baseline dimension, Dim base Continuous dimension, Multi-leader setting, create multi-leader, Multi-leader edit, multi-leader align.

6-GROUP & PROPERTIES TOOLS: New group, Edit group, Active and inactive group, Properties command (color, line type, Line weight, show icon, Match properties, etc).

7-UTILITIESTOOLS & CLIPBOARD: UT tools (distance, Radius, Angle, Area, volume, quick select, Quick calculator, point, ID point), copy, cut, paste, Paste as a block, paste special.

8-BLOCK AND ATTRIBUTES BLOCK: create block (Block & write block) Insert block, block Editor ATTRIBUTES (create attributes, Attributes mode setting, block Attributes, insert attributes, Edit attributes,

9- CONSTRAINTS GEOMETRIC CONSTRAINT: Coincident, parallel, tangent Collinear, midpoint, smooth Concentric, Horizontal, symmetric Lock, Vertical, Equal, Show and hide constraints

10- REFERENCES: External reference, Attach files IMPORT: Import2D, import3D, OLELAYOUTS: Multi-view, paper space, model space Page setup, print setup Print setting, PDF conversion DXF, batch print, Tool palettes, design Centre, Add object to Tool Palettes and Design Centre, Insert object from Tool Palettes and Design Centre.

Practicals:

1. Making 2d Drawing using cad tools like draw modify and others.(3sheetA3size)
2. Detailingofabovesheetwithusinglayerspropertyanddimensioning.(3sheetA3size)

3. Making Presentation Drawing using advance tool like has block attributes text and refrences.(3sheetA3size)

*(The above job should for a small residential unit/complete or part work of current architecture problem).

REFERENCE BOOKS :

1. AutoCAD 2022 user's manual.

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HISTORY OF ARCHITECTURE – II

Course Code	AC 4001
Course Title	HISTORY OF ARCHITECTURE – II
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

India has a vast variety of architecture. The evolution development and growth of architecture in India plays very important role. The students must be acquainted with the trend in Indian history. After study of Indian architecture students must know the works of important Architects in the world. After study of the subject the student will have a wide scope of development in this field.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Recognize the different labels & periods in architecture from Islamic invasions in India to western Architecture.
2. Identify buildings from each of the selected styles & periods.
3. Understand the relationship between history of architecture & practical work.
4. Compare, analyze and make critique of various works of renowned architects.

CONTENTS

1. Islamic Architecture in India (Imperial Style) :

1.1 Imperial style, its beginning under the Slave kings.
1.2 The buildings of the Khilji Dynasty.
1.3 The Tughlaq Dynasty.
1.4 The Sayyid and the Lodhi Dynasties.

2. Study of Greek and Roman Architecture:

3. Study of Works of Outstanding Architects like :

3.1	Mies Vander Rohe	1886-1969
3.2	Frank Lloyd Wright	1867-1959
3.3	Le Corbusier	1887-1959
3.4	Alvar Aalto	1887-1953
3.5	Buck Minister Fuller	
3.6	Kenzo Tange	
3.7	Charles Correa	
3.8	Lauri Baker	

REFERENCE BOOKS :

1. The Bauhas — Walter Groupius
2. A History of Architecture (10th Addition)
3. Modern Movement in Architecture — Charles – Jencks
4. World Architecture Vol. – 1,2,3,4
5. Modern Architecture — W.J.Curtis

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ESTIMATING AND SPECIFICATIONS

Course Code	AC 4002
Course Title	ESTIMATING AND SPECIFICATIONS
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

Knowledge of different type of estimate and preparation, Calculation of quantity of various items is important for an Architecture student to know how estimated cost of any building and various items included.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Prepare quantity estimate for small buildings, septic tank & soak pits as per specifications.
2. Draft detailed specifications & work out rate analysis for all works related to civil engineering.
3. Acquire basic knowlwdge of how to prepare tenders & contract documents.

CONTENTS

1. Estimate :

1.1 Types of estimate
1.2 Method of estimate in-to-in and out to out and centre line method
1.3 Various Performa used in estimate
1.4 Measurement book, units of payments for various item
1.5 Preparation of detailed estimate of small residential building

2. Analysis of Rates :

2.1 Analysis of rates for various building items
2.2 Thumb rule method for calculation of steel in R.C.C.

3. Specifications :

3.1 Specification writing
3.2 Principle and detailed specification
3.3 Preparation of contract documents
3.4 Various term used : Work order, Measurement book, Petty cash, Imprest and others

4. Detailed Estimate for Various Items of Works from given Drawing :

4.1 Septic tank and soak pit
4.2 Two room set house

TUTORIALS

1. Writing units for various items of work involved in construction.
2. Finding all the quantities of work for a residential building.
3. Calculation of arch, Masonry work
4. Preparation of detailed estimate of a residential building.
5. Writing detailed specification and rate analysis schedule for -

    5.1 Concrete in foundation
    5.2 Earth work in excavation
    5.3 Brick work in sub and super structure
    5.4 Random rubble and ashlar masonry.
    5.5 RCC in beams and slabs-
    5.6 Plastering
    5.7 Pointing.
    5.8 White washing, colour washing and distempering.
    5.9 Woodwork in doors and windows.
    5.10 Painting and polishing for wood work and steel work.

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BUILDING CONSTRUCTION - II

Course Code	AC 4003
Course Title	BUILDING CONSTRUCTION - II
Number of Credits	2 (L: 1, T: 1, P: 0)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Construction methods of different components of building shall be known to an architecture student to such an extent that he may be able to reproduce them on drawing board, for this it is essential to make him understand the details and drawing of various parts of general building types.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. To identify the factors to be considered in construction of buildings and develop the construction practices and techniques.
2. To identify, analyze and implement various materials & kinds of openings as per site suitability.
3. To help students identify and select appropriate openings, DPC, lifts escalators and different staircases.

CONTENTS

1. Wooden Doors and Windows:

1.1 General terms and definition of technical terms.
1.2 Definition of Doors, Windows and Ventilators and their location.
1.3 Type of Doors.
1.4 Type of Windows and Ventilators and their functional use

2. Stairs:

2.1 General terms used in stairs
2.2 Types of stairs adopted in modern practice
2.3 Requirement of stairs.
2.4 Arrangement of dog - legged stairs and open well stairs

3. Passengers Lifts :

3.1 Necessity
3.2 Location
3.3 Operation of Lifts

4. Escalators :

4.1 Elementary knowledge of working of escalators

5. Partitions and their uses:

5.1 Various types of partitions
5.2 Acoustic partitions.

6. Panelling:

6.1 Wall Panelling
6.2 Timber Flooring
6.3 P.V.C. Flooring

7. False Ceilings and Their Uses:

7.1 Various types of false ceiling

7.1.1 Continuous false ceiling
7.1.2 Panelled false ceiling

7.2 Decorative (Open false ceilings)

TUTORIALS

1 Stair Case:
1.1 Stair case details.

2. Passenger Lift
2.1 Lift well section detail.

3. Partitions:

3.1 Space divider visual Partitions
3.2 Acoustical partitions

4. Panelling:

4.1 Wall panelling

5. False Ceilings:

5.1 False ceiling in Plaster of Paris
5.2 Panelled false ceiling

REFERENCE BOOKS:

1. Architects Working Details Vol. I to II — Prem. Tandem
2. Architectural Working Drawing — Malvin L. Thomas
3. Architects Data Sheets — Edwin Mills

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MECHANICS OF STRUCTURES

Course Code	AC 40041
Course Title	MECHANICS OF STRUCTURES
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

In Engineering every structure or machine element is designed for a particular application. Then it is tested. A Diploma holder should be capable of designing the various elements for particular requirements. For this he must be able to calculate the stresses in an elements and their nature.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand the basics of material properties, stress & strain. To apply knowledge of mathematics, science for engineering applications.
2. Understand the concept of bending moment & shear force and its theoretical analysis.
3. Make selection of materials & cross section of materials.
4. Understand the effects of external loads on a specific section of the members.
5. Learn how the engineering problems are solved by using the information given in the course.

CONTENTS

1. Simple Stress and Strain :

1.1 Various mechanical properties

- 1.1.1 Elasticity
- 1.1.2 Plasticity
- 1.1.3 Ductility
- 1.1.4 Brittleness
- 1.1.5 Toughness
- 1.1.6 Hardness

1.2 Concept of stress and strain

- 1.2.1 Type of force - Direct, shear
- 1.2.2 Stress - Tensile, compressive, shear

1.3 Hook's law

- 1.3.1 Statement of Hook's law
- 1.3.2 Young's modulus of elasticity
- 1.3.3 Tensile test diagram
  - 1.3.3.1 Gauge length
  - 1.3.3.2 Limit of proportionality
  - 1.3.3.3 Elastic limit
  - 1.3.3.4 Yield point, Yield strength
  - 1.3.3.5 Ultimate stress
  - 1.3.3.6 Rupture strength
  - 1.3.3.7 Nominal stress
  - 1.3.3.8 Proof stress

1.4 Working stress and factor of safety

1.5 Stress and strain calculations

1.5.1 Principle of superposition
1.5.2 Bar of homogeneous section
1.5.2.1 Bar of uniform cross-section
1.5.2.2 Bar of steeped cross-section
1.5.3 Bar of composite section

1.6 Temperature stresses

1.6.1 Homogeneous section
1.6.2 Composite section

1.7 Shear stresses

1.7.1 Modulus of rigidity
1.7.2 Complementary shear stress
1.7.3 Concept of single shear and double shear
1.7.4 Shear strain

1.8 Poisson's ratio and volumetric strain

1.8.1 Lateral strain
1.8.2 Longitudinal strain
1.8.3 Volumetric strain
1.8.4 Bulk modulus

2. Bending Moments and Shear Force :

2.1 Basic concept

2.1.1 Types of support

2.1.1.1 Movable hinge support (roller)
2.1.1.2 Immovable hinge support
2.1.1.3 Fixed support

2.1.2 Types of beam

2.1.2.1 Cantilever beam
2.1.2.2 Simply supported beam
2.1.2.3 Fixed beam
2.1.2.4 Continuous beam
2.1.2.5 Overhanging beam

2.1.3 Types of load

2.1.3.1 Point load
2.1.3.2 Distributed load - uniformly and non uniformly

2.2 Shear force and bending moment

2.2.1 Concept and calculation of shear force and bending moment
2.2.2 Sign convention for shear force and bending moment

2.3 Bending moment and shear force diagrams (for point loads, U.D.L. and their combinations)
2.3.1 Cantilever beam
2.3.2 Simply supported beam

2.3.3 Simply supported beam with over hang

3. Moment of Inertia :

3.1 Concept of moment of Inertia
3.2 Radius of gyration

3.2.1 Parallel axis theorem
3.2.2 Perpendicular axis theorem
3.3 Moment of Inertia of various section
3.3.1 Rectangle
3.3.2 Triangle
3.3.3 Circle
3.4 Moment of inertia of unsymmetrical section like : T-section, channel section, L-section etc.

4. Bending Stresses in Beams :

4.1 Concept of bending stress
4.2 Theory of simple bending

4.2.1 Assumptions in theory of simple bending
4.2.2 Use of equation $\frac{M}{I} = \frac{f}{y} = \frac{E}{R}$ (without proof)

5. Shear Stress in Beams :

5.1 Concept
5.2 Use of equation $q = \frac{F}{Ib}(A\bar{y})$ (without proof)
5.3 Shear stress distribution diagram of various sections

5.3.1 Rectangle
5.3.2 I section
5.3.3 T section
5.3.4 Channel section
5.3.5 H section
5.3.6 + section
5.3.7 Circular section

6. Columns and Struts :

6.1 Concept of column and struts
6.2 Modes of failure
6.3 Types of column; long and short
6.4 Buckling loads
6.5 Slenderness ratio
6.6 Euler's formula (without proof)

6.6.1 Both ends hinged
6.6.2 One end fixed and other end free
6.6.3 Both ends fixed
6.6.4 One end fixed and other end hinged
6.6.5 Limitations of Euler's Formula
6.6.6 Equivalent length

6.7 Rankine's formula

REFERENCE BOOKS :

1. Strength of Materials & Theory of Structures (vol. I) — B.C.Punmia
2. Strength of Materials — Ramamurtham
3. Strength of Materials — Junarkar
4. Strength of Materials — R.S. Khurmi
5. Strength of Materials (Hindi) — Gurcharan singh

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CLIMATOLOGY

Course Code	AC 40042
Course Title	CLIMATOLOGY
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

To Equip the students with scientific background required to design climate responsive buildings, by offering a clear understanding of the various climatic zones and its climate responsive considerations in architectural design of building and built up areas.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Apply appropriate design strategies such as building orientation, shading devices & insulating walls & roofs in the studio design problem.
2. Analyze an urban environment in use; understand the activities, social utility& provision of services, construction methods & possibility for change.
3. Various efficient design techniques for different climatic zones.

CONTENTS

1. Introduction to Climatology:

Importance of Climate in Architecture, Weather & Climate, Solar Radiation Quantities & thermal balance. Macro & Micro climate, Elements of Climate such as Temperature, Humidity, Solar radiation, Wind, etc. Sun path diagram, types and Design of shading devices.

2. Types of Climate:

Different types of climate and their characteristics. Design consideration in Tropical Climate. Effect of climate on Habitat, shelter and environment. Effect of landscape elements on Climate and Architecture. .

3. Thermal Comfort:

Thermal comfort factors, Method of heat transfer, Effective Temperature CET. Psychometric chart. Shading devices. Thermal behaviour of building Elements & different building Materials.

4. DayLight, Ventilation & Air movement:

Natural light sources, Day light factors. Air movements & Ventilation. Function of Ventilations, Types of Ventilations. Effect of opening on ventilation.

5. Passive means of thermal control:

Simple passive techniques such as orientation, form, building envelop, opening etc.

REFERENCES:

1. Chand, I. and Bhargava, P. K. (1999). The Climatic Hand Book. New Delhi : Tata McGraw-Hill.
2. Kaushik, S. C. (1989). Solar Refrigeration and Space Conditioning, Jodhpur : Divya-jyotiPrakashan.
3. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A. and Szokolay, S. V. (1980). Manual ofTropical Housing and Building: Climatic design. Hyderabad : Orient Longman.
4. Kukreja, C. P. (1982). Tropical Architecture. New Delhi : McGraw–Hill.
5. Lam, W. M. C. (1986). Sun-lighting as Form-giver for Architecture. New York : Van NostrandReinhold.
6. Olgyay, A. and Olgyay, V. (1976). Solar Control and Shading Devices. New Jersey : PrincetonUniversity Press.
7. Sudha, M. S., Bansal, N. K., Kumar, A. and Bansal, P. K. (1986). Solar passive buildings, science
8. and design. London : Pergamon Press.

• Low cost construction material for housing

• Composite material- ferro-cement & fly ash, autoclaved calcium silicate bricks and
• soil-stabilized un-burnt brick; Plinth protection of mud walls.
• Water-proof and fire-retardant roof treatment for thatch roofs. Pre-cast stone masonry, rattrap bond for walls; Panels for roof, ferro-cement flooring/roofing units.
• Biomass - types of fuels such as firewood, agricultural residues, dung cakes.
• Renewable energy and integrated rural energy program - Objectives, Key elements, Implementation, Financial provisions, sources of renewable energy.

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BUILDING INFORMATION MODELING

Course Code	AC 4005
Course Title	BUILDING INFORMATION MODELING
Number of Credits	3 (L: 1, T: 2, P: 0)
Course Category	SEC
Prerequisites	NIL

Course Description:

This course introduces the fundamentals of Building Information Modeling (BIM). Students will get an overview regarding the emerging trends and practices in vogue for BIM. The course will cover the principles, tools, and techniques used in BIM.

Course Objectives:

- Understand the basic concepts and principles of BIM.
- Learn to understand BIM models.
- Understand the role of BIM in the construction project lifecycle.

Course Outline:

Unit-1: Overview of BIM

1.1 Definition and history of BIM
1.2 Importance and benefits of BIM in construction
1.3 Key stakeholders and their roles

Unit-2: BIM Standards and Protocols

2.1 BIM standards and guidelines (e.g., ISO 19650)
2.2 BIM execution plans
2.3 Legal and contractual considerations

Unit-3: Introduction to BIM Software

3.1 Overview of popular BIM software

- Autodesk Revit
- STAAD Pro
- Arch GIS

Unit- 4: BIM in Design and Construction

4.1 BIM for design visualization and analysis

4.2 BIM in construction planning and scheduling

Unit-5 BIM for Facilities Management

5.1 BIM for operations and maintenance
5.2 Lifecycle management using BIM

Recommended Textbooks and Resources:

- "BIM Handbook: A Guide to Building Information Modeling for Owners, Managers, Designers, Engineers, and Contractors" by Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston
- Online tutorials and resources for specific BIM software tools (e.g., Autodesk Revit tutorials)
- Industry standards and guidelines (e.g., ISO 19650)

ARCHITECTURE DESIGN STUDIO – II

Course Code	AC 4006
Course Title	ARCHITECTURE DESIGN STUDIO – II
Number of Credits	3 (L: 0, T: 0, P: 6)
Course Category	PC
Prerequisites	NIL

RATIONALE

Large percentage of diploma holders in Architecture find employment with Private Architects and also majority of them go for self employment therefore diploma holder are required to design small Educational institutes and public facility buildings. These course aims at providing practical exercises in designing so as to develop appropriate knowledge and skills in building design.

Teachers are expected to show various type of designs of small Educational institutes and public facility buildings to develop an appreciation of different designs and understanding of indoor and outdoor spaces, various circulations and parkings.. Teachers should also motivate student to maintain their sketchbook in which they draw line and sketch of different architectural styles

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Identify user needs & translate them into a program & thereafter use the program to manifest them in a design in terms of space, materials & construction methodology that is appropriate in a particular context.

CONTENTS

1. Circulation & Space :

1.1 Types of circulation such as internal, external, Elements of circulation.
1.2 Types of space such as public, semi public, private, service & servant spaces etc

1. Architectural Concept:

1.1 Various sources of inspiration for design.
1.2 Types of Concept.
1.3 Concept as a response to site and context.

2. Study Report: Case study of existing building type:

2.1 Site Analysis.
2.2 Framing of design requirements,
2.3 Area analysis for various spaces.
2.4 On site observation.

4. Design of small educational and Public facility buildings

4.1 Nursery School
4.2 Children `s Library
4.3 Neighborhood Bank
4.4 Small post office

(Name of the building is only meant to give idea, size and scope of design)

REFERENCE BOOKS :

1. National Building code of India 1983
2. Neufert Architect Data. M.G. Shah
3. Building Drawing Kale and Patki
4. Time Saver Standards (Building Type)
5. Architectural Magazines published time to time

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GRAPHICAL PRESENTATION - II LAB

Course Code	AC 4007
Course Title	GRAPHICAL PRESENTATION - II LAB
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	PC
Prerequisites	NIL

RATIONALE

Graphical presentation forms a core subject for preparing perspective drawing, scale drawing, three-dimensional views, furniture drawings and layout. Therefore this course aims at equipping the student with the skills of graphical presentation of his design ideas through various graphic.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Review graphic standards from architectural Graphics I for continuity.
2. Translate architectural elements into interior elevation.
3. Apply the projected drawing method of interior perspective, how to create them and how to adapt them to a variety of different interiors.
4. Construct one &two point perspective drawings from floor plans.
5. Articulate an understanding of volumetric drawings used in interior design.

CONTENTS

1. Perspective :

1.1 Methods of one point perspective.
1.2 Method of two point perspective.
1.3 Aerial view.

2. Rendering :

2.1 Importance of rendering in architectural Drawing.
2.2 Architectural rendering techniques in pencil, pen and ink of Different textures.
2.3 Rendering in perspective.

3. Presentation Drawing :

3.1 Plans
3.2 Elevation
3.3 Sections
3.4 Perspectives

4. Free Hand Sketching in Sketch Books :

4.1 Simple objects
4.2 Busy Market streets
4.3 Landscape

PRACTICALS

1.	Two-point perspective of simple geometrical forms	1 sheets
2.	Two-point perspective of complex geometrical forms	1 sheets
3.	One point perspective – a simple exercise	1 sheet
1.	One point perspective of simple solid object	1 sheet
2.	One point perspective of Bed room	1 sheet
3.	Two point perspective of a Building	1 sheet
4.	Rendering techniques in pen and ink of different textures	2 sheets
5.	Presentation drawing of - Plans	1 sheet
	Elevations	1 sheet
	Sections	1 sheet

6.	Entrance lobby of an Office, Visitors room, Committee room	1 sheet
7.	Rendering in site plans showing Street scape	1 sheet

REFERENCE BOOKS :

Rendering in Pen & Ink

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BUILDING CONSTRUCTION STUDIO-II

Course Code	AC 4009
Course Title	BUILDING CONSTRUCTION STUDIO-II
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Construction methods of different components of building shall be known to an architecture student to such an extent that he may be able to reproduce them on drawing board, for this it is essential to make him understand the details and drawing of various parts of general building types.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. To identify the factors to be considered in construction of buildings and develop the construction practices and techniques.
2. To identify, analyze and implement various materials & kinds of openings as per site suitability.
3. To help students identify and select appropriate openings, DPC, lifts escalators and different staircases.

PRACTICALS

1 Stair Case Details: (2 Sheets)

2. Passenger Lift/ Dumbwaiter/ Mechanical Parking (2 Sheets)
- 2.1 Lift well section detail.
- 2.2 Escalator.

3. Partitions: (2 Sheets)
- 3.1 Space divider visual Partitions.
- 3.2 Acoustical partitions.

4. Panelling: (2 Sheets)
- 4.1 Wall panelling.

5. False Ceilings: (2 Sheets)
- 5.1 False ceiling in Plaster of Paris
- 5.2 Panelled false ceiling

6. Doors & Windows (3 Sheets)

REFERENCE BOOKS:

1. Architects Working Details Vol. I to II	Prem. Tandem
2. Architectural Working Drawing	Malvin L. Thomas
3. Architects Data Sheets	Edwin Mills
4. Building Construction 1 to 4	W. B. Meky
5. Building Construction 1 to 5	Chudley (ECBC Publication)
6. National Building Code 2016	BIS Code

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ESSENCE OF INDIAN KNOWLEDGE AND TRADITION

Course Code	AC 4222(Same in All Branches of Engg.)
Course Title	Essence of Indian Knowledge and Tradition
Number of Credits	0(L-2,T-0, P-0)
Prerequisites	None
Course Category	AU

COURSE CONTENTS:

Basic Structure of Indian Knowledge System:

(i)वेद,

(ii)उत्तवेद (आयुवेद,धनुवेद,गन्धवेद,स्थात्तत्यआदद)

(iii)वेदथाथांग (शिक्था, कलत्त, ननरुत, व्थाकरण, ज्योनतषछथांद),

(iv)उत्तथाइग (धर्मशथास्त्र, र्ीर्थथांसथा, तुरथाण, तकशरथास्त्र)

- •Modern Science and Indian Knowledge System
- •Yoga and Holistic Health care
- •Case Studies.

REFERENCES /SUGGESTED LEARNING RESOURCES:

1. V. Sivarama Krishna, " Cultural Heritage of India- Course Material", Bhartiya Vidya Bhavan, Mumbai, fifth Edition, 2014.
2. Swami Jitatmanand, " Modern Physics and Vedant", Bhartiya Vidya Bhavan.
3. Fritz of Capra, " The wave of Life".
4. Fritz of Capra, " Tao of Physics".
5. V N Jha, " Tarka sangraha of Annam Bhatta, International" Cinmay Foundation, Velliarnad, Amakuam.
6. R N Jha, " Science of Consciousness Psychotheraphy and Yoga Practices" Vidya nidhi Prakasham, Delhi, 2016.

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BUILDING SERVICES & DRAWING

Course Code	AC 5001
Course Title	BUILDING SERVICES & DRAWING
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Students of architecture at diploma level are expected to have knowledge of various fittings and fixtures of water supply and sanitary installations for preparation of working drawings. A part from this they should be aware of drawings system, electrical lay out and Mechanical installations in the building.
Therefore the subject is very important for students undergoing diploma course in Architecture.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Select and apply technically sound building services.
2. Understand Water Services, Sanitation, Electrical Services, Storm Water Drainage and Rain Water collection and disposal.
3. Learn basic electrical services at domestic level.

CONTENTS

1. Building Sanitation :

1.1 Glossary of terms
1.2 Surface drains
1.3 System of drains

1.3.1 Separate and combined systems
1.3.2 Domestic drains, flushing of drains and sewers
1.3.3 Standard type of drains
1.3.4 R.C. drains sewers
1.3.5 Earthenware pipes, cement – concrete pipes, P.V.C. – pipes, Cast Iron pipes and testing of pipes

2. Manholes :

2.1 Spacing of manholes
2.2 Sizes of manholes
2.3 Ventilation of sewers

3. House Drainage :

3.1 Types of traps and functions
3.2 Inspection chambers
3.3 Ventilation of house drains
3.4 Intercepting traps, gully traps, grease traps
3.5 Anti - Syphonage or vent pipes
3.6 One and two pipes systems
3.7 Sinks , baths, water closets, flushing cisterns, urinals lavatory basins
3.8 Sizes of pipes and taps for house drawings
3.9 Testing drawings pipes for leakage, smoke list water test
3.10 C.I. Pipes for disposal and rain water drawings
3.11 Wrought iron, steel and brass pipes

4. Plumbing and Internal Fixture :

4.1 Joints for various types of pipes

4.2 Sanitary fitting standards for public convenience
4.3 Septic tank and seepage pits and soak pits

5. Domestic Water Supply :

5.1 Consumption on demand of water for domestic purposes
5.2 Leakage and wastage of water and its preventive measure
5.3 Service connection from mains
5.4 Distribution of water supply
5.5 Cold and hot water supply
5.6 Fittings and pipes of different materials

6. Electrical Fittings and Layouts :

6.1 Type of switches
6.2 Type of wires and wiring
6.3 Earthing
6.4 Electrical layout showing fans, lighting fixture M.C.B. , E.L.C.B. and meter
6.5 Telephones and T.V. aerial lines
6.6 Brief knowledge of Air cooling, ducting and distribution

7. Acoustics:

7.1 Properties of Sound.
7.2 Sound Insulation.
7.3 Sound Absorption.
7.4 Acoustic Design of a Hall.
7.5 Guidelines for a Good acoustic Design.

REFERENCE BOOKS :

1	Building Services	Deshpandey
2.	Building construction	P.C. Punmia
3.	Water supply engineering	S.K. Gang
1.	National Building code	
2.	Advanced building construction	Mitchell
3.	Electrical wiring and fittings	M.K. Dalal
4.	Electrical Engineering	K.D. Sharma
5.	National Electricity Code	

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BUILDING BYE LAWS & MUNICIPAL DRAWING

Course Code	AC 5002
Course Title	BUILDING BYE LAWS & MUNICIPAL DRAWING
Number of Credits	3 (L: 2, T: 1, P: 0)
Course Category	PC
Prerequisites	NIL

RATIONALE

Knowledge of preparation of municipal drawings and building bye-laws is must for the students who are seeking Diploma in Architecture. All the buildings which are to be erected has to be approved or sanctioned by the local Municipal Authority, Development Authority or any Regulatory Authority before the execution

At the college level the student should be well acquainted with bye-laws and shall be able to prepare the Municipal drawings. He shall be aware of submission to Regulatory Authority.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand the prevailing rules & regulations applicable for development control & regulations by regulatory bodies.
2. Understand the hierarchy of development control & regulations for better planned development.
3. Study local bye-laws & to get maximum benefit in terms of preparing municipal drawings.
4. Understand the approval procedure of drawings via local authorities.

CONTENTS

1. Importance of building bye laws and study in detail of the local building bye laws with respect to Zonal plans

2. Statement of areas showing all necessary details as per requirement

3. Procedure of submission of municipal drawings for formal sanction

4. Method of preparing Submission Drawing

5. Method of Calculation of Plot of Different Shapes.

6. Method of Calculation of Area's

6.1 Covered area
6.2 Carpet area
6.3 Floor area ratio / Built up area ratio.
6.4 Floor space Index etc.

TUTORIALS

1. Building Bye Laws : (drawing work to be done during SCA)

2.1 Principle and necessity of framing Bye laws of urban development.
2.2 Study of local building bye laws and local Zoning plans
2.3 Preparation of one set of municipal is drawing for submission of a residence having all sides open.

2. Municipal Drawing:

2.1 Preparation of different floor plans
2.2 Preparation of elevation

2.3 Sections

2.3.1 Through toilet
2.3.2 Staircase
2.3.3 Mezzanine floor
2.3.4 Basement etc.

2.4 Preparation of site plan showing placement - Of buildings, road, adjoining buildings, Services like sewer line, Water line etc.

REFERENCE BOOKS:

1. Master plan of local area
2. Building bye laws of local regulatory body i.e., JDA
3. National building code

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ECONOMIC POLICIES IN INDIA

Course Code	AC 51001(Same in All Branches of Engg.)
Course Title	Economic Policies in India
Number of Credits	3 (L:3,T:0,P:0)
Prerequisites	NIL
Course Category	OE

COURSE LEARNING OBJECTIVES:

The objective of this course is to familiarize the students of different streams with the basic concepts, structure, problems and issues concerning Indian economy.

CO1	Understand Indian economics policy, planning strategies
CO2	It will enable to students to comprehend theoretical and empirical development across countries and region for policy purposes
CO3	Development Economics as a discipline encompasses different approach estotheproblemsofunemployment,poverty,incomegeneration,industrializationfromdifferentperspectives
CO4	Abletoidentifytheproblemsandcapabletodecidetheapplicationforfuturedevelopment
CO5	Analyzeeconomicissuesandfindsolutionstocomplexeconomicproblemsandtakecorrecteconomicjudgment

COURSE CONTENTS:

1. **BASIC FEATURES AND PROBLEMS OF INDIAN ECONOMY:**
   - 1.1. Economic History of India;
   - 1.2. Nature of Indian Economy
   - 1.3. Demographic features and Human Development Index,
   - 1.4. Problems of Poverty, Unemploy-ment, Inflation, income inequality, Blackmoney in India.

2. **SECTORAL COMPOSITION OF INDIAN ECONOMY:**
   - 2.1. Issues in Agriculture sector in India,
   - 2.2. land reforms
   - 2.3. Green Revolution
   - 2.4. agriculture policies of India,
   - 2.5.

3. **INDUSTRIAL DEVELOPMENT,**
   - 3.1. Small scale and cottage industries,
   - 3.2. Industrial Policy,
   - 3.3. Public sector in India,
   - 3.4. Service sector in India.

4. **ECONOMIC POLICIES:**
   - 4.1. Economic Planning in India,
   - 4.2. Planning commission v/s NITI Aayog,
   - 4.3. Five Year Plans,
   - 4.4. Monetary policy in India,
   - 4.5. Fiscal Policy in India,
   - 4.6. Centre state Finance Relations,
   - 4.7. Finance commission in India
   - 4.8. LPG policy in India

5. **EXTERNAL SECTOR IN INDIA**
   - 5.1. India's foreign trade value composition and direction,
   - 5.2. India Balance of payment since 1991,
   - 5.3. FDI in India,
   - 5.4. Impact of Globalization on Indian Economy,
   - 5.5. WTO and India.

REFERENCE BOOKS:

1. Dutt Rudder and K.P.M Sunderam (2017). Indian Economy .S Chand &Co.Ltd. New Delhi.
2. Mishra S. K &V. K Puri (2017). Indian Economy and Its Development Experience. Himalaya Publishing House.
3. Singh, Ramesh, (2016): Indian Economy, Tata-McGraw Hill Publications, New Delhi.
4. Dhingra, I.C., (2017): March of the Indian Economy, Heed Publications Pvt. Ltd.
5. Karam Singh Gill, (1978): Evolution of the Indian Economy, NCERT, NewDelhi
6. Kaushik Basu (2007): The Oxford Companion to Economics of India ,Oxford University Press.

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ENGINEERING ECONOMICS & ACCOUNTANCY

Course Code	AC 51002 (Same in All Branches of Engg.)
Course Title	Engineering Economics & Accountancy
Number of Credits	3 (L:3, T:0, P:0)
Prerequisites	NIL
Course Category	OE

COURSE OBJECTIVES

•To acquire knowledge of basic economicst of a cilitate the process of economic decision making.
•To acquire knowledge on basic financial management aspects.
•To develop the basic skills to analyze financial statements.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Understand the macro-economic environment of the business and its impact on enterprise
CO2	Understand cost elements of the product and its effect on decision making
CO3	Prepare accounting records and summarize and interpret the accounting datafor managerial decisions
CO4	Understand accounting systems and analyze financial statements using ratio analysis
CO5	Understand the concepts of financial management and investment

COURSE CONTENTS

1. INTRODUCTION:

1.1. Managerial Economics;
1.2. Relationship with other disciplines;
1.3. Firms: Types, objectives and goals;
1.4. Managerial decisions;
1.5. Decision analysis.

2. DEMAND & SUPPLY ANALYSIS:

2.1. Demand;
2.1.1. Types of demand;
2.1.2. Determinants of demand;
2.1.3. Demand function;
2.1.4. Demand elasticity;
2.1.5. Demand forecasting;
2.2. Supply;
2.2.1. Determinants of supply;
2.2.2. Supply function;
2.2.3. Supply elasticity.

3. PRODUCTION AND COST ANALYSIS:

3.1. Production function;
3.2. Returns to scale;
3.3. Production optimization;
3.4. Least cost input; Iso quants;
3.5. Managerial uses of production function;
3.6. Cost Concepts;
3.6.1. Cost function;
3.6.2. Types of Cost;
3.6.3. Determinants of cost;
3.6.4. Short run and Long run cost curves;
3.6.5. Cost Output Decision;
3.6.6. Estimation of Cost.

4. PRICING:

4.1. Determinants of Price;

4.2. Pricing under different objectives and different market structures;
4.3. Price discrimination;
4.4. Pricing methods in practice;
4.5. Role of Government in pricing control.

5. FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT):

5.1. Balance sheet and related concepts;
5.2. Profit & Loss Statement and related concepts;
5.3. Financial Ratio Analysis;
5.4. Cash flow analysis;
5.5. Funds flow analysis;
5.6. Comparative financial statements;
5.7. Analysis & Interpretation of financial statements;
5.8. Investments;
5.9. Risks and return evaluation of investment decision;
5.10. Average rate of return;
5.11. Payback Period;
5.12. Net Present Value;
5.13. Internal rate of return,

REFERENCE BOOKS:

1.Mc Guigan, Moyer and Harris,' Managerial Economics; Applications, Strategy and Tactics', Thomson South Western, 10th Edition, 2005.
2.Prasanna Chandra. 'Fundamentals of Financial Management', Tata Mcgraw Hill Publishing Ltd., 4th edition,2005.
3.Samuelson. Paul A and Nordhaus W. D., 'Economics', Tata Mcgraw Hill Publishing Company Limited, New Delhi, 2004.
4.Paresh Shah, 'Basic Financial Accounting for Management', Oxford University Press, NewDelhi, 2007.
5.Salvatore Dominick, 'Managerial Economics in a global economy'. Thomson SouthWestern, 4th Edition, 2001.

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BUILDING CONSTRUCTION – III

Course Code	AC 5003
Course Title	BUILDING CONSTRUCTION - III
Number of Credits	2 (L: 1, T: 1, P: 0)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Construction methods of different components of building shall be known to an architecture student to such an extent that he may be able to reproduce them on drawing board, for this it is essential to make him understand the details and drawing of various parts of general building types.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand various specifications listed under National building code for Toilets.
2. Become familiar with various construction materials & methods in practice for residential & public furniture.
3. Learn standard sizes of interior movable & immovable furniture.

CONTENTS

1. Toilets: Types and general specification. (N.B.C.)

1.1 Residential Toilets : Standard norms and also idea about low cost concept.
1.2 Industrial, Institution and office toilets : Standard norms and specification
1.3 Toilets at public places and recreation centres : Standard norms and specification

2. Ward-Robes and Side Boards: Types and functional standards

2.1 Inbuilt wardrobes
2.2 Free standing wardrobes / cupboards
2.3 Cabinets
2.4 Side boards
2.5 Use of materials like

2.5.1 Glass
2.5.2 Laminate
2.5.3 Veneer
2.5.4 Engineering plastics is to be studied

3. Kitchens : Types and functional norms / standards

3.1 Residential Kitchens: Standard functional norms and material specification, electrical gadgets.
3.2 Commercial Kitchens : Standard functional norms and material specification. Study of functional plan and service concepts
3.3 Institutional and Industrial Kitchens : Standard functional norms and material specification. Study of functional plan and service concepts. Idea about space requirement and working of manned and unmanned machinery is to be imparted/ studied.

3.3.1 Trolley
3.3.2 Hot vending machine
3.3.3 Cold vending machine
3.3.4 Micro vending machine
3.3.5 Vending machine (micro wave oven)
3.3.6 Self service buffet layout.

4. Counters:

4.1 Different type of counters
4.2 Post office counter.
4.3 Bank counter
4.4 Reception counter of hotels/ public offices
4.5 Bar counter
4.6 Materials used in counters

TUTORIALS

1. Toilets :

1.1 Domestic Toilet
1.2 Public Toilets
1.3 I.S.I./N.B.C. Standards

2. Side Boards and Wardrobes :

2.1 Free standing type.
2.2 Wardrobe for residence
2.3 Wardrobe for hotel
2.4 Different materials used in Wardrobes and its fastenings

3. Kitchen Details :

3.1 Kitchen Counter
3.2 Kitchen Sink
3.3 Kitchen shelves
3.4 Kitchen cabinets
3.5 Wall and floor finishing used (Site visit)

4. Counters

4.1 Detail of bank counter in plan and section
4.2 Detail of reception counter of hotel

REFERENCE BOOKS:

1. Architects Working Details Vol. I to II — Prem. Tandem
2. Architectural Working Drawing — Malvin L. Thomas
3. Architects Data Sheets — Edwin Mill

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GREEN BUILDING & ENERGY CONSERVATION

Course Code	AC 50041(Same as CC/CE/CV 50041)
Course Title	Green Building and Energy Conservation
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

COURSE OBJECTIVES

Following are the objectives of this course:

- To know various aspects of green buildings
- To use different steps involved in measuring environmental impact assessment.
- To relate the construction of green building with prevailing energy conservation policy and regulations.
- To know and identify different green building construction materials.
- To learn different rating systems and their criteria.

COURSE OUTCOMES

After completing this course, student will be able to:

- Identify various requirements for green building.
- Use different steps in environmental impact assessment.
- Relate the construction of green building with prevailing energy conservation policy and regulations.
- Supervise the construction of green building construction using green materials.
- Focus on criteria related to particular rating system for assessment of particular Green building.

COURSE CONTENT

1. Introduction to Green Building and Design Features

1.1 Definition of Green Building, Benefits of Green building, Components/features of Green Building, Site selection, Energy Efficiency, Water efficiency, Material Efficiency, Indoor Air Quality.

1.2 Site selection strategies, Landscaping, building form, orientation, building envelope and fenestration, material and construction techniques, roofs, walls, fenestration and shaded finishes, advanced passive heating and cooling techniques, waste reduction during construction

2. Energy Audit and Environmental Impact Assessment (EIA)

2.1 Energy Audit:
- 2.1.1 Meaning
- 2.1.2 Necessity
- 2.1.3 Procedures
- 2.1.4 Types,
- 2.1.5 Energy Management Programs

2.2 Environmental Impact Assessment(EIA):
- 2.2.1 Introduction
- 2.2.2 EIA regulations
- 2.2.3 Steps in environmental impact assessment process
- 2.2.4 Benefits of EIA
- 2.2.5 Limitations of EIA
- 2.2.6 Environmental clearance for the civil engineering projects

3. Energy and Energy conservation

3.1 Renewable Energy Resources:
- 3.1.1 Solar Energy
- 3.1.2 Wind Energy
- 3.1.3 Ocean Energy
- 3.1.4 Hydro Energy
- 3.1.5 Biomass Energy

3.2 Non-renewable Energy Resources:
- 3.2.1 Coal,
- 3.2.2 Petroleum,
- 3.2.3 Natural Gas,

3.2.4 Nuclear Energy,
3.2.5 Chemical Sources of Energy,
3.2.6 Fuel Cells,
3.2.7 Hydrogen,
3.2.8 Biofuels.

3.3 Energy conservation:
3.3.1 Introduction, Specific objectives, present scenario, Need of energy conservation, LEED India Rating System and Energy Efficiency.

4. Green Building

4.1 Principles
4.1.1 Principles and planning of Green building

4.2 Features
4.2.1 Salient features of Green Building,
4.2.2 Environmental design (ED) strategies for building construction.

4.3 Process:
4.3.1 Improvement in environmental quality in civil structure

4.4 Materials:
4.4.1 Green building materials and products
4.4.1.1 Bamboo
4.4.1.2 Rice husk ash concrete
4.4.1.3 plastic bricks
4.4.1.4 Bagasse particle board
4.4.1.5 Insulated concrete forms
4.4.2 reuse of waste material
4.4.2.1 Plastic
4.4.2.2 rubber
4.4.2.3 Newspaper wood
4.4.2.4 Nontoxic paint
4.4.2.5 Green roofing

5. Rating System

5.1 Introduction to(LEED) criteria,
5.2 Indian Green Building council (IGBC) Green rating,
5.3 Green Rating for Integrated Habitat Assessment. (GRIHA) criteria
5.4 Heating Ventilation Air Conditioning (HVAC) unit in green Building
5.5 Functions of Government organization working for Energy conservation and Audit(ECA)-
5.6 National Productivity council(NPC)
5.7 Ministry of New and Renewable *Energy* (MNRE)
5.8 Bureau of Energy efficiency (BEE)

SUGGESTED LEARNING RESOURCES

1. Kibert, C.J., Sustainable construction: Green Building design and Delivery, John Wiley Hoboken, New Jersey.
2. Chauhan, D S Sreevasthava, S K., Non-conventional Energy Resources, New Age International Publishers, New Delhi.
3. O.P. Gupta, Energy Technology, Khanna Publishing House, New Delhi
4. Jagadeesh, K S, Reddy Venkatta Rama &Nanjunda Rao, K S., Alternative Building Materials and Technologies, New Age International Publishers, Delhi.
5. Sam Kubba., Handbook of Green Building Design and Construction, Butterworth-Heinemann.
6. Means R S, Green Building - Project Planning and Cost Estimating, John Wiley & Sons
7. Sharma K V, Venkataseshaiah P., Energy Management and Conservation, IK International.

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ADVANCED CONSTRUCTION TECHNOLOGY

Course Code	AC 50042 (Same as CE 50042)
Course Title	ADVANCED CONSTRUCTION TECHNOLOGY
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

COURSE OBJECTIVES

Following are the objectives of this course:

1 To gain knowledge on different materials in advanced construction
2 To know different methods in concreting.
3 To know the relevance of advanced construction methods for particular site condition.
4 To identify the requisite hoisting and conveying machinery for the given situation.

COURSE OUTCOMES

After completing this course, student will be able to:

1 Use relevant materials in advanced construction of structures.
2 Use relevant method of concreting and equipment according to type of construction.
3 Apply advanced construction methods for given site condition.
4 Select suitable hoisting and conveying equipment for a given situation.
5 Identify advanced equipment required for a particular site condition

COURSE CONTENT

1. Advanced Construction Materials

1.1 Fibres: Use and properties of steel, polypropylene, carbon and glass fibres.
1.2 Plastics: Use and properties of PVC, RPVC, HDPE, FRP, GRP.
1.3 Miscellaneous Materials: Properties and uses of acoustics materials, wall claddings, plaster boards, micro-silica, waterproofing materials, adhesives.
1.4 Use of waste products and industrial byproducts in bricks, blocks, concrete and mortar.

2. Advanced Concreting Methods and Equipments

2.1 Ready Mix Concrete: Necessity and use of readymix concrete. Products and equipments for ready mix concrete plant. Conveying of ready mix concrete, transit mixers.
2.2 Vibrators for concrete consolidation: Internal, needle, surface, platform and form vibrators.
2.3 Underwater Concreting: Procedure and equipments required for Tremie method, Drop bucket method. Properties, workability and water cement ratio of the concrete.
2.4 Special concrete: procedure and uses ofspecial concretes: Roller compacted concrete, Self-compacting concrete (SCC), Steel fibre reinforced concrete, Foam concrete, shotcreting.

3. Advanced Technology in Constructions

3.1 Construction of bridges and flyovers: Equipments and machineries required for foundation and super structure.
3.2 Construction of multi-storeyed Building: Equipments and machinery required for construction of multi-storeyed building such as use of lifts, belt conveyers, pumping of concrete.
3.3 Prefabricated construction: Methods of prefabrication, Plant fabrication and site fabrication, All prefabricated building elements such as wall panels, slab panels, beams, columns, door and window frames etc. Equipments and machineries used for placing and Jointing of prefabricated elements.
3.4 Strengthening of embankments by soil reinforcing techniques using geo-synthetics

4. Hoisting and Conveying Equipments

4.1 Hoisting Equipments: Derrick-Pole, Gin Pole, Crane, Power driven scotch derrick crane, Hand operated crane, Locomotive crane, Tower crane, Lattice Girder, Winches, Elevators, ladders. Crawler cranes, Truck mounted cranes, Gantry cranes, Mast cranes. (only introduction & uses)
4.2 Conveying Equipments: Working of belt conveyers, types of belts and conveying mechanism. Capacity and use of dumpers, tractors and trucks.

5 Miscellaneous Machineries and Equipments

5.1 Excavation Equipments: bull dozers, scrapers, graders, Clam Shell, trenching equipment, Tunnel boring machine, Wheel mounted belt loaders, power shovels, JCB, and drag lines. (only introduction & uses)

5.2 Compacting Equipments: different types of rollers such as plain rollers, ship footed rollers, vibratory, pneumatic rollers rammers.(only introduction & uses)

5.3 Miscellaneous Equipments: Working and selection of equipments: Pile driving equipments, Pile hammers, Hot mix bitumen plant, bitumen paver, grouting equipment, gunitingequipments, floor polishing and cutting machine(only introduction & uses) selection of drilling pattern for blasting, Bentonite/mud slurry in drilling, Explosives for blasting, Dynamite, process of using explosives.

SUGGESTED LEARNING RESOURCES

1. Sharma S C andDeodhar S V, Construction Engineering and Management, Khanna Book Publishing, New Delhi
2. Chudly, R., Construction Technology Vol. I to II, ELBS-Longman Group.
3. Peurifoy, R. L., Construction Planning Equipment and Methods,McGraw Hill Co. Ltd. New York.
4. Seetharaman, S., Construction Engineering and Management, Umesh Publication, New Delhi.
5. Sengupta, B. and Guha., Construction Management and Planning, McGraw Hill Education, New Delhi.
6. Smith, R. C., Materials of Construction, McGraw Hill Co. Ltd.
7. Satyanarayana, R Saxena, S. C., Construction Planning and Equipment, Standard Publication, New Delhi.
8. Rangawala,S. C., Construction of Structures and Management of works, Charotar Publication, Anand.
9. Ghose,D. N., Materials of Construction, McGraw Hill Publishing Co, New Delhi.

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STRUCTURAL DRAWING AND DETAILING

Course Code	AC 50051
Course Title	STRUCTURAL DRAWING AND DETAILING
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

Apart from building design and drawing a student of architecture must have structural sense. For multidisciplinary works architecture student must know the basics of R.C.C. and steel. Since he is not concerned with design of structures, stress is given on the drawing and detailing part of structures.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Provide knowledge of analysis in structural planning and design of various components of building.
2. Assess different types of loading and prepare layout for reinforces concrete structures.
3. Understand material properties and design methodologies for RCC, Pre stressed and Steel Structures.

CONTENTS

1. Concrete Technology :

1.1 Definition of concrete
1.2 Requirement of good concrete
1.3 Ingredients of concrete, Their function and requirement as per Indian standards
1.4 Grades of concrete
1.5 Permissible stresses
1.6 Methods of mixing, transportation, placing and compaction of concrete
1.7 Curing of concrete
1.8 Sampling and test strength of concrete
1.9 Joints in concrete structures
1.10 Form work for concrete types and purpose
1.11 Requirement of form work for beams, slabs and columns

2. Reinforcement :

2.1 Types, grades of reinforcement bars
2.2 Permissible stresses in steel as per IS-456
2.3 Standard sizes of reinforcement bars and their weight and perimeters

3. R.C.C. (Only theory/ no numerical) :

3.1 Concept of R.C.C.
3.2 Assumption in the theory of simple bending in R.C.C. beam
3.3 Flexural strength of reinforced beams
3.4 Position of neutral axis
3.5 Concept of balanced, under reinforced and over reinforced section
3.6 Shear and bond, concept of diagonal tension, shear reinforced, vertical stirrups, inclined bars
3.7 Bond length, anchorage hooks splices as per I.S. 456
3.8 Load and Loading standards for R.C.C. structures
3.9 Concept of one way slab, two way slab
3.10 Doubly reinforced beams
3.11 Elements of T- Beams and columns

4. **Pre stressed Concrete Structures (theory only) :**

4.1 Concept of pre - stressing
4.2 Advantage / disadvantage of pre stress system of pre stressing
4.3 Losses in pre stressing

5. Steel Structures (theory only) :

5.1 Load types : live, dead and wind loads
5.2 Rolled section types : angle ,Y- channel, tubes , flats, sheets and plates
5.3 As per I.S. 800 permissible stress in bending, shear, bearing and tension
5.4 Use of steel tables / tubes

REFERENCE BOOKS :

1. Design of R.C.C. B.C. Punmia
2. Reinforced Concrete Design Raju
3. Design of Reinforced Concrete G.C. Singh

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TOWN PLANNING AND LANDSCAPE DESIGN

Course Code	AC 50052
Course Title	TOWN PLANNING AND LANDSCAPE DESIGN
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

The course is only intended to give general information on the scope of work involved in the field of Town Planning as well as in its related subject of sociology.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Develop understanding of well planned town for the population.
2. Understand the concepts & theories of development with pros & cons.
3. Contribute in a better manner to individual needs for residence, commerce, industry, open spaces, institution etc.

CONTENTS

1. Town Planning:

1.1 Introduction
1.2 Definition and aim
1.3 Objects of town planning
1.4 Necessity of town planning

2. Forms of Planning: in general term

2.1 Master planning
2.2 Regional planning
2.3 National planning
2.4 Site for an Ideal town
2.5 Requirements of new towns

3. Principles of Town Planning:

3.1 Origin and growth of town
- 3.1.1 Growth according to origin
- 3.1.2 Growth according to direction

3.2 Industrialization and its impact on modern town planning
3.3 Surveys : general
- 3.3.1 Necessity of surveys
- 3.3.2 Collection of data
- 3.3.3 Types of surveys
- 3.3.4 Uses of surveys

4. Zoning:

4.1 Term (definition) and objects of zoning
- 4.1.1 Principles and advantages of zoning
- 4.1.2 Importance and aspects of zoning

4.2 Traffic management
- 4.2.1 General and objects
- 4.2.2 Traffic congestion, control

4.3 Road planning
- 4.3.1 Road junctions
- 4.3.2 Road traffic problems and accidents

5. Types of Town Developments:
- 5.1 Suburbs
- 5.2 Dormitory town
- 5.3 Satellites
- 5.4 Garden cities
- 5.5 Ribbon development
- 5.6 Grid iron patterns
- 5.7 Rad burn layout
- 5.8 Neighbour hood planning

6. Housing:

6.1 Housing
- 6.1.1 Housing problems in India
- 6.1.2 Demand for houses
- 6.1.3 Factors affecting housing problems

6.2 Rural housings
- 6.2.1 Aspects of rural housing
- 6.2.2 Typical rural house
- 6.2.3 Hurdles in rural housing

6.3 Legislation and its need in the field of town planning
- 6.3.1 Powers required to enforce town planning schemes

7. Factors for the Growth of a Town:

- 7.1 Site selection for an ideal town
- 7.2 Requirements of new town
- 7.3 Designing / planning aspects for a town layout

8. Landscape Design :

8.1 Introduction to landscape architecture. Definations& Scope in Architecture.

8.2 Salient features of landscape architecture. Elements of landscape Architecture Design. Land forms, Plant Material, Water bodies, Pavement, Site Structures like Steps , Ramps, Walls , Fences, Seating, etc.

REFERENCE BOOKS:

1. Town Planning — Dr.Rame Gowda.
2. City Planning According to Artistic Principles — Comillositte.
3. Town & Country Planning — A.P.R.R.
4. Town Planning — Rangwala.

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ARCHITECTURE DESIGN STUDIO – III

Course Code	AC 5006
Course Title	ARCHITECTURE DESIGN STUDIO – III
Number of Credits	3 (L: 0, T: 0, P: 6)
Course Category	PC
Prerequisites	NIL

RATIONALE

Large percentages of diploma holders in Architecture find employment with private Architects and also majority of them goes for self-employment. Therefore diploma holders are required to design commercial, community, institutional, and residential apartment buildings.

This course aim at providing practical exercise in designing so as to develops appropriate knowledge and skills in structures , services ,public convenience facilities and parking in building design.

Teachers are expected to show various types of design of such buildings to develop an appreciation of different design. Teachers should also motivate students to maintain their sketchbook in which they draw lines and sketches of different architectural styles.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Implicate knowledge of design fundamentals & knowledge gained in other subjects to develop better design solutions.
2. Develop appropriate graphic skills & presentation techniques (models, rendering) to explain the contents of design.

PRACTICALS

Note : Design of building involving two or more floors, split level etc. The building can be like nursing home, school, public library, recreational and commercial buldings.

1. Study Report : Parking's.

- 1.1. Various types of parking layout
- 1.2. Sizes of various vehicles. (Plans& Elevations,)
- 1.3. Turning radius of various vehicles. (Plan,)
- 1.4. Various types of road widths.
- 1.5. Different types of parking layouts. (Plans of 45, 60, 90 degree parking.)
- 1.6. Study of parking in existing building type
  - 1.6.1 Site analysis
  - 1.6.2 Analysis of space requirements
  - 1.6.3 Site observations and design concept

2. Design of Building :

- 2.1 Neighbourhood Shopping centre.
- 2.2 Secondary School.
- 2.3 Office building etc

3. Presentation Drawings of a given Building:

- 3.1 Site plan
- 3.2 Ground floor plans
- 3.3 First floor plans
- 3.4 Subsequent plan if required
- 3.5 Terrace plan
- 3.6 Minimum two sections
- 3.7 Four elevations

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4. Study Report:

4.1 Case study of existing building type.
4.2 Study of site.
4.3 Analyses of requirements,
4.4 Design concept. Based on study

REFERENCE BOOKS :

1. Traffic View of Architecture CorviufierChales Jan
2. Living Architecture Series
3. Architecture in India Electa Mon
4. National Building code of India 1983.
5. Time Saver Standards.
6. Architects Data Neuferts.
7. Architects working detail

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BUILDING CONSTRUCTION STUDIO – III

Course Code	AC 5009
Course Title	BUILDING CONSTRUCTION STUDIO - III
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	BS&AE
Prerequisites	NIL

RATIONALE

Construction methods of different components of building shall be known to an architecture student to such an extent that he may be able to reproduce them on drawing board, for this it is essential to make him understand the details and drawing of various parts of general building types.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

4. Understand various specifications listed under National building code for Toilets.
5. Become familiar with various construction materials & methods in practice for residential & public furniture.
6. Learn standard sizes of interior movable & immovable furniture.

PRACTICALS

1. Toilets :

1.1	Domestic Toilet	
1.2	Public Toilets	
1.3	I.S.I./N.B.C. Standards	3 Sheets

2. Side Boards and Wardrobes :

2.1	Free standing type.	
2.2	Wardrobe for residence	
2.3	Wardrobe for hotel	
2.4	Different materials used in Wardrobes and its fastenings	4 Sheets

3. Kitchen Details :

3.1	Kitchen Counter	
3.2	Kitchen Sink	
3.3	Kitchen shelves	
3.4	Kitchen cabinets	
3.5	Wall and floor finishing used (Site visit)	4 Sheets

4. Counters

4.1	Detail of bank counter in plan and section	1 sheet
4.2	Detail of reception counter of hotel	1 sheet

REFERENCE BOOKS:

1. Architects Working Details Vol. I to II — Prem. Tandem
2. Architectural Working Drawing — Malvin L. Thomas
3. Architects Data Sheets — Edwin Mill

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ENTREPRENEURSHIP AND START-UPS

Course Code	AC 6111(Same in All Branches of Engg.)
Course Title	Entrepreneurship and Start-ups
Number of Credits	4 (L- 3,T-1, P-0)
Prerequisites (Course code)	None
Course Category	HS

COURSE LEARNING OBJECTIVES:

1. Acquiring Entrepreneurial spirit and resourcefulness.
2. Familiarization with varioususesofhuman resource for earning dignified means of living.
3. Understanding the concept and process of entrepreneurship-its contribution and role in the growth and development of individual and the nation.
4. Acquiring entrepreneurial quality, competency, and motivation.
5. Learning the process and skills of creation and management of entrepreneurial venture.

LEARNING OUTCOME:

Upon completion of the course, these student will be able to demonstrate knowledge of the following topics:

1. Understanding the dynamic role of entrepreneurship and small businesses
2. Organizing and Managing a Small Business
3. Financial Planning and Control
4. Forms of Ownership for Small Business
5. StrategicMarketing Planning
6. New Productor Service Development
7. Business Plan Creation

COURSE CONTENTS:

1. INTRODUCTION TO ENTREPRENEURSHIP AND START–UPS

- 1.1. Definitions, Traits of an entrepreneur, Intrapreneurship, Motivation
- 1.2. Types of Business Structures,
- 1.3. Similarities / differences between entrepreneurs and managers.

2. BUSINESS IDEAS AND THEIR IMPLEMENTATION

- 2.1. Discovering ideas and visualizing the business
- 2.2. Activity map
- 2.3. Business Plan

3. IDEA TO START-UP

- 3.1. Market Analysis– Identifying the target market,
- 3.2. Competition evaluation and Strategy Development,
- 3.3. Marketing and accounting,
- 3.4. Risk analysis

4. MANAGEMENT

- 4.1. Company's Organization Structure,
- 4.2. Recruitment and management of talent.
- 4.3. Financial organization and management

5. FINANCING AND PROTECTION OF IDEAS

- 5.1. Financing methods available for start-ups in India
- 5.2. Communication of Ideas to potential investors– Investor Pitch
- 5.3. Patenting and Licenses

6. EXIT STRATEGIES FOR ENTREPRENEURS ,BANKRUPTCY, AND SUCCESSION ANDHARVESTING STRATEGY

SUGGESTED LEARNING RESOURCES:

S.No.	Title of Book	Author	Publication
1.	The Startup Owner's Manual: The Step by-Step Guide for Building a Great Company	Steve Blank and Bob Dorf	K & S Ranch ISBN–978-0984999392
2.	The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses	Eric Ries	Penguin UK ISBN–978-0670921607
3.	Demand: Creating What People Love Before They Know They Want It	Adrian J. Slywotzky with Karl Weber	Headline Book Publishing ISBN–978-0755388974
4.	The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business	Clayton M. Chris Tensen	Harvard business ISBN:978-142219602

SUGGESTEDSOFTWARE/LEARNINGWEBSITES:

a. https://www.fundable.com/learn/resources/guides/startup
b. https://corporatefinanceinstitute.com/resources/knowledge/finance/corporatehstructure/
c .https://www.finder.com/small-business-finance-tips
d. https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/

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PROJECT MANAGEMENT

CourseCode	AC 62001(Same in All Branches of Engg.)
CourseTitle	Project Management
NumberofCredits	3(L:3,T:0,P:0)
Prerequisites	NIL
CourseCategory	OE

COURSE LEARNING OBJECTIVES

•To develop the idea of project plan, from defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved.

•To develop an understanding of key project management skills and strategies.

COURSE OUTCOMES

At the end of the course, the student will be able to:

CO1	Understand the importance of projects and its phases.
CO2	Analyze projects from marketing, operational and financial perspectives.
CO3	Evaluate projects based on discount and non-discount methods.
CO4	Develop network diagrams for planning and execution of a given project.
CO5	Apply crashing procedures for time and cost optimization.

COURSE CONTENTS

1. **CONCEPT OF A PROJECT**:
   - 1.1. Classification of projects
   - 1.2. Importance of project management
   - 1.3. The project Life cycle
   - 1.4. Establishing project priorities (scope-cost-time)
   - 1.5. Project priority matrix
   - 1.6. Work break down structure.

2. **CAPITAL BUDGETING PROCESS:**
   - 2.1. Planning -Analysis-Selection-Financing-Implementation-Review.
   - 2.2. Generation and screening of project ideas
   - 2.3. Market and demand analysis
   - 2.4. Demand forecasting techniques.
   - 2.5. Market planning and marketing research process
   - 2.6. Technical analysis

3. **FINANCIAL ESTIMATES AND PROJECTIONS:**
   - 3.1. Cost of projects
   - 3.2. Means of financing
   - 3.3. Estimates of sales and production-cost of production
   - 3.4. Working capital requirement and its financing
   - 3.5. Profitability project , cash flow statement and balance sheet.
   - 3.6. Breakeven analysis.

4. **BASIC TECHNIQUES IN CAPITAL BUDGETING**:
   - 4.1. Non discounting and discounting methods
   - 4.2. pay-back period
   - 4.3. Accounting rate of return
   - 4.4. Net present value
   - 4.5. Benefit cost ratio
   - 4.6. Internal rate of return.
   - 4.7. Project risk.
   - 4.8. Social cost benefit analysis and economic rate of return.
   - 4.9. Non-financial justification of projects.

5. PROJECT ADMINISTRATION:

5.1. Progress payments,
5.2. Expenditure planning,
5.3. Project scheduling and network planning,
5.4. Use of Critical Path Method(CPM),
5.5. Schedule of payments and physical progress,
5.6. time-cost trade off.
5.7. Concepts and uses of PERT
5.8. Cost as a function of time,
5.9. Project Evaluation and Review Techniques
5.10. Cost mechanisms.
5.11. Determination of least cost duration.
5.12. Post project evaluation.
5.13. Introduction to various Project management softwares.

REFERENCE BOOKS

1.Project planning, analysis, selection, implementation and review –Prasannachandra–Tata McGraw Hill
2.Project Management – the Managerial Process– Clifford F. Gray & Erik W. Larson-McGrawHill
3.Project management- David I Cleland- Mcgraw Hill International Edition, 1999
4.Project Management– Gopala krishnan– Mcmillan India Ltd.
5.Project Management- Harry – Maylor – Peason Publication

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RENEWABLE ENERGY TECHNOLOGIES

CourseCode	AC 62002(Same in All Branches of Engg.)
CourseTitle	Renewable Energy Technologies
NumberoCredits	3 (L:3,T:0,P:0)
Prerequisites	NIL
CourseCategory	OE

COURSE LEARNING OBJECTIVES

•To understand present and future scenario of world energy use.
•To understand fundamentals of solar energy systems.
•To understand basics of wind energy.
•To understand bio energy and its usage in different ways.
•To identify different available non-conventional energy sources.

COURSE OUTCOMES

At the end of the course, the student will be able to:

CO1	Understand present and future energy scenario of the world.
CO2	Understand various methods of solar energy harvesting.
CO3	Identify various wind energy systems.
CO4	Evaluate appropriate methods for Bio energy generations from various Bio wastes.
CO5	Identify suitable energy sources for a location.

COURSE CONTENTS

1. INTRODUCTION:

1.1. World Energy Use;
1.2. Reserves of Energy Resources;
1.3. Environmental Aspects OF Energy Utilisation;
1.4. Renewable Energy Scenario in India and around the World;
1.5. Potentials; Achievements/ Applications;
1.6. Economics of renewable energy systems.

2. SOLAR ENERGY:

2.1. Solar Radiation;
2.2. Measurements of Solar Radiation;
2.3. Flat Plate and Concentrating Collectors;
2.4. Solar direct Thermal Applications;
2.5. Solar thermal Power Generation
2.6. Fundamentals of Solar Photo Voltaic Conversion;
2.7. Solar Cells;
2.8. Solar PV Power Generation;
2.9. Solar PV Applications.

3. WIND ENERGY:

3.1. Wind Data and Energy Estimation;
3.2. Types of Wind Energy Systems;
3.3. Performance; Site Selection;
3.4. Details of Wind Turbine Generator;
3.5. Safety and Environmental Aspects.

4. BIO-ENERGY:

4.1. Bio mass direct combustion;
4.2. Bio mass gasifiers;
4.3. Bio gas plants;
4.4. Digesters;
4.5. Ethanol production;

4.6. Bio diesel;
4.7. Cogeneration;
4.8. Bio mass Applications.

5. OTHER RENEWABLE ENERGY SOURCES:

5.1. Tidal energy;
5.2. Wave Energy;
5.3. Open and Closed OTEC Cycles;
5.4. Small Hydro Geothermal Energy;
5.5. Hydrogen and Storage;
5.6. Fuel Cell Systems;
5.7. Hybrid Systems.

REFERENCE BOOKS

1. Non-Conventional Energy Sources, Rai. G. D., Khanna Publishers, New Delhi, 2011.
2. Renewable Energy Sources, Twidell, J.W. & Weir, A., EFN SponLtd.,UK,2 006.
3. Solar Energy, Sukhatme. S. P., Tata Mc Graw Hill Publishing CompanyLtd. ,New Delhi, 1997.
4. Renewable Energy, Power for a Sustainable Future, Godfrey Boyle, Oxford University Press, U.K., 1996.
5. Fundamental of Renewable Energy Sources, G N Tiwari and M K Ghoshal, Narosa, New Delhi, 2007.
6. Renewable Energy and Environment A Policy Analysis for India ,NHRavindranath, U K Rao, B Natarajan, P Monga, Tata McGraw Hill.
7. Energy and The Environment, R A Ristinen and J JKraushaar, second edition, John Willey & Sons, New York, 2006.
8. Renewable Energy Resources, J W T widell and A D Weir, ELBS, 2006.

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PRODUCT DESIGN

CourseCode	AC 63001(Same in All Branches of Engg.)
CourseTitle	Product Design
NumberofCredits	3 (L:3,T:0,P:0)
Prerequisites	NIL
CourseCategory	OE

COURSE LEARNING OBJECTIVES

•To acquire the basic concepts of product design and development process
•To understand the engineering and scientific process in executing a design from concept to finished product
•To study the key reasons for design or redesign.

COURSE OUTCOMES

At the end of the course, the student will be able to:

CO1	Understand the basic concepts of product design and development process.
CO2	Illustrate the methods to define thecustomer needs.
CO3	Describe an engineering design and development process.
CO4	Understand the intuitive and advanced methods used to develop and evaluate a concept.
CO5	Apply modelling and embodiment principles in product design and development process.

COURSE CONTENTS

1. DEFINITION OF A PRODUCT

1.1. Types of product;
1.2. Levels of product;
1.3. Product-market mix;
1.4. New prod-uct development (NPD) process;
1.5. Idea generation methods;
1.6. Creativity;
  1.6.1. Creative attitude;
  1.6.2. Creative design process;
1.7. Morpho logical analysis;
1.8. Analysis of inter-connected decision areas;
1.9. Brain storming.

2. PRODUCT LIFECYCLE;

2.1. The challenges of Product development;
2.2. Product analysis;
2.3. Product characteristics;
2.4. Economic considerations;
2.5. Production and Marketing aspects;
2.6. Characteristics of successful Product development;
2.7. Phases of a generic product development process;
2.8. Customer need identification;
2.9. Product development practices and industry-product strategies.

3. PRODUCT DESIGN

3.1. Design by evolution;
3.2. Design by innovation;
3.3. Design by imitation;
3.4. Factors affecting product design;
3.5. Standards of performance and environmental factors;
3.6. Decision making and iteration;
3.7. Morphology of design (different phases);
3.8. Role of aesthetics in design.

4. INTRODUCTION TO OPTIMIZATION IN DESIGN

4.1. Economic factors in design;
4.2. Design for safety and reliability;
4.3. Role of computers in design;
4.4. Modeling and Simulation;
4.5. The role of models in engineering design;
4.6. Mathematical modeling;
4.7. Similitude and scale models;
4.8. Concurrent design;
4.9. Six sigma and design for six sigma;
4.10. Introduction to optimization in design;
4.11. Economic factors and financial feasibility in design;
4.12. Design for manufacturing;
4.13. Rapid Proto typing (RP);
4.14. Application of RP in product design;
4.15. Product Development versus Design.

5. DESIGN OF SIMPLE PRODUCTS DEALING WITH VARIOUS ASPECTS OF PRODUCT DEVELOPMENT;

5.1. Design Starting from need till the manufacture of the product

REFERENCE BOOKS

1.Product Design and Development, Karl T.Ulrichand Steven D.Eppinger, TataMc Graw–Hill edition.
2.Engineering Design– George E. Dieter.
3.An Introduction to Engineering Design methods Vijay Gupta.
4.Merie Crawford: New Product management, McGraw-Hill Irwin.
5.Chitale A K and Gupta R C," Product Design and Manufacturing", Prentice Hall of India, 2005.
6.Kevin Otto and Kristin Wood, Product Design, Techniques in Reverse Engineering and New Product Development, Pears on education.

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DISASTER MANAGEMENT

Course Code	AC 63002(Same in All Branches of Engg.)
Course Title	Disaster Management
Number of Credits	3 (L: 3, T: 0 ,P :0)
Prerequisites	NIL
Course Category	OE

COURSE LEARNING OBJECTIVES

Following are the objectives of this course:

•To learn about various types of natural and man-made disasters.
•To know pre and post-disaster management for some of the disasters.
•To know about various information and organizations in disaster management in India.
•To get exposed to technological tools and their role in disaster management.

COURSE OUTCOMES:

1.1. After competing this course, student will be:
1.2. Acquainted with basic information on various types of disasters
1.3. Knowing the precautions and awareness regarding various disasters
1.4. Decide first action to be taken under various disasters
1.5. Familiarised with organization in India which are dealing with disasters
1.6. Able to select IT tools to help in disaster management

COURSE CONTENTS

1. UNDERSTANDING DISASTER

1.1. Understanding the Concepts and definitions of Disaster,
1.2. Hazard,
1.3. Vulnerability,
1.4. Risk,
1.5. Capacity–Disaster and Development,
1.6. Disaster management.

2. TYPES, TRENDS, CAUSES, CONSEQUENCES AND CONTROL OF DISASTERS

2.1. Geological Disasters (earth quakes, land slides,tsunami, mining);
2.2. Hydro-Meteorological Di-sasters (floods, cyclones, lightning, thunder-storms, hailstorms, avalanches, droughts, cold and heat waves)
2.3. Biological Disasters(epidemics, pestattacks, forestfire);
2.4. Technological Disasters (chemical, industrial, radiological, nuclear)
2.5. Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters)
2.6. Global Disaster Trends
2.7. Emerging Risks of Disasters
2.8. Climate Change and Urban Disasters.

3. DISASTER MANAGEMENT CYCLE AND FRAME WORK

3.1. Disaster Management Cycle
3.2. Paradigm Shift in Disaster Management.
3.3. Pre-Disaster
3.4. Risk Assessment and Analysis,
3.5. Risk Mapping,
3.6. Zonation and Microzonation,
3.7. Prevention and Mitigation of Disasters,
3.8. Early Warning System
  3.8.1. Preparedness,
  3.8.2. Capacity Development;
  3.8.3. Awareness.
3.9. During Disaster
  3.9.1. Evacuation
  3.9.2. Disaster Communication

3.9.3. Search and Rescue
3.9.4. Emergency Operation Centre
3.9.5. Incident Comm and System
3.9.6. Relief and Rehabilitation

3.10. Post-disaster
3.10.1. Damage and Needs Assessment,
3.10.2. Restoration of Critical Infra structure
3.10.3. Early Recovery Reconstruction and Redevelopment;
3.10.4. IDNDR, Yokohama Stretegy, Hyogo Frame-work of Action.

4. DISASTER MANAGEMENT IN INDIA

4.1. Disaster Profile of India
4.2. Mega Disasters of India and Lessons Learnt.
4.3. Disaster Management Act 2005
4.4. Institutional and Financial Mechanism,
4.5. National Policy on Disaster Management,
4.6. National Guidelines and Plans on Disaster Management;
4.7. Role of Government (local, state and national),
4.8. Non-Government and Inter Governmental Agencies

5. APPLICATIONS OF SCIENCE AND TECHNOLOGY FOR DISASTER MANAGEMENT

5.1. Geo informatics in Disaster Management (RS, GIS, GPS and RS).
5.2. Disaster Communication System (Early Warning and Its Dissemination).
5.3. Land Use Planning and Development Regulations,
5.4. Disaster Safe Designs and Constructions,
5.5. Structural and Non Structural Mitigation of Disasters
5.6. S & T Institutions for Disaster Management in India

REFERENCES

1.Publications of National Disaster Management Authority (NDMA) on Various Templates and Guide lines for Disaster Management
2.Bhandani, R. K., An over view on natural & man-made disasters and their reduction, CSIR, New Delhi
3.Srivastava, H. N., and Gupta G. D. , Management of Natural Disasters in developing countries, Daya Publishers, Delhi
4.Alexander, David, Natural Disasters, Kluwer Academic London
5.Ghosh, G .K. ,Disaster Management, APH Publishing Corporation
6.Murthy, D. B. N., Disaster Management: Text & Case Studies, Deep & Deep Pvt. Ltd.

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INDIAN CONSTITUTION

CourseCode	AC 6333(Same in All Branches of Engg.)
CourseTitle	Indian Constitution
NumberofCredits	0 (L:2,T:0;P:0)
Prerequisites(Coursecode)	None
CourseCategory	AU

COURSE CONTENT

1. THE CONSTITUTION –

1.1. Introduction
1.2. The History of the Making of the Indian Constitution
1.3. Preamble and the Basic Structure, and its interpretation
1.4. Fundamental Rights and Duties and their interpretation
1.5. State Policy Principles

2. UNION GOVERNMENT

2.1. Structure of the Indian Union
2.2. President– Role and Power
2.3. Prime Minister and Council of Ministers
2.4. Lok Sabha and Rajya Sabha

3. STATE GOVERNMENT

3.1. Governor– Role and Power
3.2. Chief Minister and Council of Ministers
3.3. State Secretariat

4. LOCAL ADMINISTRATION

4.1. District Administration
4.2. Municipal Corporation
4.3. Zila Panchayat

5. ELECTION COMMISSION

5.1. Role and Functioning
5.2. Chief Election Commissioner
5.3. State Election Commission

SUGGESTED LEARNING RESOURCES:

S.No.	Title of Book	Author	Publication
1.	Ethics and Politics of the Indian Constitution	Rajeev Bhargava	Oxford University Press, New Delhi, 2008
2.	The Constitution of India	B.L.Fadia	Sahitya Bhawan; New edition(2017)
3.	Introduction to the Constitution of India	D DBasu	Lexis Nexis; Twenty-Third 2018 edition

SUGGESTED SOFTWARE / LEARNING WEBSITES:

1. https://www.constitution.org/cons/india/const.html
2. http://www.legislative.gov.in/constitution-of-india
3. https://www.sci.gov.in/constitution
4. https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/

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ELECTRICAL, HVAC, FIRE SAFETY AND BUILDING AUTOMATION

Course Code	AC 60011
Course Title	ELECTRICAL, HVAC, FIRE SAFETY AND BUILDING AUTOMATION
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

Apart from building design and drawing a student of architecture should have the understanding of important Services in buildings, definitions and terms used, functioning and their applications in building.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Select and apply technically sound building services.
2. Understand water services, sanitation, electrical services, storm water drainage and rain water collection and disposal.
3. Helps students to learn basic electrical services at domestic level.

CONTENTS

Unit-I. Fundamental Electrical Concepts

Fundamental principles of Electricity, voltage, amperage, wattage. Generation & distribution of power, LT&HT lines, electricity conductors, Indian Electricity Act.

Unit-II. Electrical Systems in Built-Environment

Electricity distribution in buildings, Service wires, meter boards, circuits, switch boards, electrical safety devices in buildings, MCBs, Earthing. Introduction to Electric layouts.

Unit-III. Air Conditioning

Air-conditioning: refrigeration cycle, systems of air conditioning: Unit, split, package, Directexpansion, Chilled water System, Ducting & air conditioning layout, fittings and fixtures.

Unit-IV. Fire Safety in Buildings

Fire, causes of fire and spread of fire, fire fighting, protection & fire resistance, equipment & methods of fighting fire, Code of fire safety, fire regulations, fire insurance, combustibility of materials. Structural elements and fire resistance, planning and design of Fire escape routes and elements, wet risers, dry risers, sprinklers, smoke detectors, fire dampers, fire doors, water curtains etc.

Unit-V Building Automation

Concept and application of Automation Systems in buildings. Design issues related to building automation and its effect on functional efficiency. Components of building automation system integrating HVAC, electrical, lighting, security, fire-fighting, communication etc. Current trend and innovation in building automation systems; Knowledge base and decision support systems and building automation and management system; Application of expert system in building automation.

REFERENCE BOOKS :

1. Abnwos, F. and Others. *Electrical Engineering Hand Book*.
2. Bovay, H. E. (1981). *Handbook of Mechanical & Electrical systems for Buildings*. McGraw-Hill Higher Education.
3. Bureau of Indian Standards. (2005). *Code of Practice for Electrical Wiring Installations IS-732*.
4. Electrical Wiring & Contracting (Vol.1 to Vol.4).

5. Sawhney, G. S. (2006). *Fundamentals of Mechanical Engineering: Thermodynamics, Mechanics and Strength of Materials*. New Delhi : Prentice Hall of India.
6. Taylor, E. O. and Rao, V. V. L. (1971). *Utilisation of Electric Energy in SI units*. Bombay : Orient Longman.
7. Willim, J. McG. (1971). *Mechanical & Electrical Equipment for Buildings*.

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CONSTRUCTION PROJECT MANAGEMENT

Course Code	AC 60012
Course Title	CONSTRUCTION PROJECT MANAGEMENT
Number of Credits	3 (L: 3, T: 0, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

To equip students with a practical approach to implement building projects, basic knowledge about construction industry, project management techniques needed for managing & coordinating building projects in a professional manner.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand project characteristics & various stages of a project market, technical, financial & economic stages.
2. Analyze the learning & understand techniques for project planning, scheduling & execution control.

CONTENTS

1. Introduction

Introduction to project management, construction industry, stakeholders, roles, responsibilities and functional relationships, Construction projects – objectives and lifecycle,existing construction practices & project management systems, Project Team, organization,roles, responsibilities. Concepts of project planning, scheduling & controlling. Project scaleand construction technology, human aspects in managing projects.

2. Project Planning and Scheduling

Inputs for project planning, defining activities and their interdependency, time and resourceestimation. Work breakdown structures. Liner Scheduling methods - bar charts, LOB, theirlimitations. Principles, definitions of network based scheduling methods: CPM, PERT.Network representation, Network analysis – forward and backward passes.

3.Project Monitoring and Control

Site layout and organization, Site investigations. Quality tests for construction material andprocesses. Quality control inspections. Project progress tracking. Crashing Project Schedules,its impact on time, cost and quality. Project direct and indirect costs. Safety in ConstructionProjects.

4. Resources Management and Value Engineering

Methods of material/resource estimation and management, Resources scheduling andlevelling. Labour welfare, applicable labour Legislations. Construction equipment types,characteristics & applications. Value engineering, its application in building design andconstruction.

5. Contracts and Tenders

Types of building contracts, their merits and de-merits. Types of building tenders, contents oftender documents, tendering process. General conditions of contract, security deposits,interim certificates, defect liability periods, retention amounts, mobilization money andvirtual completion.

REFERENCES:

1. Callahan, M. T., Quackenbush, D. G., & Rowings, J. E. (1992). Construction Project Scheduling. McGraw-Hill.
2. Chitkara, K. K. (2004). Construction Project Management: Planning, Scheduling and Controlling. Tata McGraw–Hill Education.
3. O'Brien, J. J., and Plotnick, F. L. (2009). CPM in Construction Management. McGraw-Hill Professional.
4. Punmia, B. C., and Khandelwal, K. K. (2006). Project planning and control with PERT and CPM. New Delhi : Laxmi Publications.
5. Wiest, J. D., and Levy, F. K. (1982). A Management Guide to PERT/CPM. New Delhi : Prentice Hall of India.

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WORKING DRAWING AND DETAILING LAB

Course Code	AC 6002
Course Title	WORKING DRAWING AND DETAILING LAB
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	PC
Prerequisites	NIL

RATIONALE

A student must acquire basic principles of building Construction, techniques of construction with various materials and of various element of building construction. He must acquaint himself with all building elements so as to enable to prepare working drawing and also to write down broad specification on drawings.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Understand the various symbols & nomenclature used for formation of working drawings & detailing.
2. Understand the phenomenon of releasing & resolving complex procedure of construction into various type of construction drawings & detailing for execution at site.
3. To make construction drawings in a manner that they are understood by each section of the vendor involved in construction activity.

PRACTICALS

1. Preparation of working drawing for any one of a residence, a public building or an institutional building.

1.1	Site plan and setting out the building	1 sheet
1.2	Foundation plans and details	2 sheets
1.3	Ground floor plan	1 sheet
1.4	First floor plan	1 sheet
1.5	Second floor plan	1 sheet
1.6	Terrace plan	1 sheet
1.7	Elevations	1 sheet
1.8	Sections	1 sheet
1.9	Doors and windows detail	1 sheet
1.10	Stair case detail	1 sheet
1.11	Kitchen detail	1 sheet
1.12	Toilet detail	1 sheet

REFERENCE BOOKS :

1. Time Saver's Standards (Building type)
2. Time Saver's Standards (Architectural Data)
3. Building Construction — W.B. Mackay
4. Working Drawing & Detailing — Shah & Kale

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ARCHITECTURE DESIGN– IV LAB

Course Code	AC 6003
Course Title	ARCHITECTURE DESIGN– IV LAB
Number of Credits	2 (L: 0, T: 0, P: 4)
Course Category	PC
Prerequisites	NIL

RATIONALE

Large percentages of diploma holders in Architecture find employment with private Architects and also majority of them goes for self-employment. Therefore diploma holders are required to design commercial , community, institutional, and residential apartment buildings.
Architecture design has a vast scope, however an endeavours to make an architecture student know various building types and study and analyse them to that they may be an asset to an Architect office.

This course aim at providing practical exercise in designing so as to develops appropriate knowledge and skills in structures , services ,public convenience facilities and parking in building design.

Teachers are expected to show various types of design of such buildings to develop an appreciation of different design. Teachers should also motivate students to maintain their sketchbook in which they draw lines and sketches of different architectural styles.

SUBJECT LEARNING OUTCOMES (SLOS)

After studying the subject, the student will be able to:

1. Implicate knowledge of design fundamentals & knowledge gained in other subjects to develop better design solutions.
2. Develop appropriate graphic skills & presentation techniques (models, rendering) to explain the contents of design.

PRACTICALS

Note : Design of building involving two or more floors, split level etc. The building can be like Youth hostel, Health Centre, Resorts, medium sized Hotels, Commercial Complex and Cultural Buildings.

1. Study Report : Public Conveniences & Fire & Electrical services

1.1. Various types of toilet layout. (Plans , Elevations & Sections,)
1.2. Calculation for providing various Facilities.
1.3. Drinking Water facilities.
1.4. Genitor Spaces .
1.5. Toilets for abled person.
1.6. Study of existing building type
  1.6.1 Analysis of space requirements
  1.6.2 Site observations and design concept

1.7. Study of Fire And Electrical installation system in existing building type
  1.5.1 Space requirements.
  1.5.2 Type of installations.
  1.5.3 Location of control system for fire alarms.
  1.5.4 Fire detecting system and Hydrants.
  1.5.5 Buzz bar & electrical transmission room & power Backup.
  1.5.2 Site observations.

2. Design of Building :

2.1 Resort.
2.2 commercial complexes.
2.3 Hospital.

3. Presentation Drawings of a given Building:

3.1 Site plan
3.2 Ground floor plans
3.3 First floor plans
3.4 Subsequent plan if required
3.5 Terrace plan
3.6 Minimum two sections
3.7 Four elevations

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4. Study Report:

4.1 Case study of existing building type.
4.2 Study of site.
4.3 Analyses of requirements,
4.4 Design concept. Based on study

REFERENCE BOOKS :

1. Traffic View of Architecture CorviufierChales Jan
2. Living Architecture Series
3. Architecture in India Electa Mon
4. National Building code of India 1983.
5. Time Saver Standards.
6. Architects Data Neuferts.
7. Architects working detail

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PROFESSIONAL PRACTICE CODE

Course Code	AC 60061
Course Title	PROFESSIONAL PRACTICE CODE
Number of Credits	2 (L: 1, T: 1, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

At the end of the course, students will be able to -

- Student will understand the professional, vocational and legal aspects of architectural practice
- Student will achieve the understanding of the code of professional conduct and law regarding the Architectural profession.
- Students will be prepared for the professional practices.

CONTENTS

Unit-I. INTRODUCTION

Architecture profession Importance of Architecture Profession, role of Architects in the society, Introduction to Architects duties and liabilities, Architects' Act 1972, Amendments & Provisions, registration of architects, relations with clients, contractors, consultants, public authorities.

Role of Council of Architecture and Indian Institute of Architects, functions, constitution, and rules & regulations. Code of professional conduct & Ethics, Social responsibility, Publications.

Unit-II PRACTICING ARCHITECTURE

Practicing Architecture Scope of work of an architect, Schedule of services, drawings to prepare, Terms & conditions of engagement, letter of appointment. Private practice, types of offices/firms, responsibilities & liabilities.

Unit-III ARCHITECTURAL COMPETITIONS

Regulations governing the conduct of competitions, open & closed competitions

Unit-IV ARBITRATION

Need for Arbitration, Principles of Indian Arbitration Act-1974, role of arbitrators, umpire etc, excepted matters, arbitral award.

References:

1. Apte, V. S. (2008). Architectural Practice and Procedure. Pune : Padmaja Bhide.
2. COA. (1989). Architects (Professional conduct) Regulations, Architectural Competition guidelines. Council of Architecture Publications.
3. COA. (2005). Handbook of Professional Documents. Council of Architecture.
4. Namavati, R. (1984). Professional practice. Mumbai : Lakhani Book Depot.
5. Architects Practice, J.J.Scott.

VERNACULAR ARCHITECTURE

Course Code	AC 60062
Course Title	VERNACULAR ARCHITECTURE
Number of Credits	2 (L: 1, T: 1, P: 0)
Course Category	PE
Prerequisites	NIL

RATIONALE

Efforts and activities related to promotion of Sustainable Architecture are underway, and this can be reinforced with the knowledge of Vernacular Architecture. Rajasthan has a rich treasure of vernacular architecture. The objective is to instill sensitivity towards the less explored field that is concerned with Architectural building traditions/practices that are cost effective, ecologically sensible and culturally relevant. Students acquire a working vocabulary that can help them describe vernacular architecture in meaningful ways. The course introduces grass root principles of indigenous architecture that has evolved over time in response to environment, climate, culture, economy and basic human needs. The course covers variations in built forms and their environmental performance across different climatic and geographical regions of India with more emphasis to Rajasthan. Cases studies of adaptations of vernacular architecture in contemporary buildings are also covered in the syllabus.

1 INTRODUCTION TO VERNACULAR ARCHITECTURE:

Definition and origin of vernacular architecture.
Factors of vernacular architecture.
Socio-cultural, geographical, climatic and religious influences on vernacular architecture

2 ENVIRONMENT AND MATERIALS:

Typical building materials, Built form and elements, Construction technique and Environmental performance.

3 REGIONAL VARIATIONS IN BUILT FORM: RURAL ARCHITECTURE

Settlement Pattern, Dwelling Typology, Symbolism, Typical features, Construction materials and techniques.

Regional dwelling patterns like 'dhanis' (hamlets), villages and their overall adaptation in the said context; Settlements and their vicinity to water resource(s) as places of worship and social activity; water related architecture and typical water resources like kua, kohar, baoli/bavdi, jhalora, bera/beri. Spaces like courtyards, platforms, jharokhas (balconies) etc.; Embellishments & Architectural expressions– Symbolism and Ornamentation, compound walls, patterns on doors and windows, mirror work and motifs, flooring patterns, etc.

Seminar presentations on the vernacular architectural practices in different regions of Rajasthan based on the above mentioned topics.

REFERENCES

1. Paul Oliver. Encyclopedia of Vernacular Architecture of the World, Cambridge University Press, 1997.

2. Amos Rapoport. House, Form & Culture, Prentice Hall Inc. 1969.

3. R W Brunskill: Illustrated Handbook on Vernacular Architecture. 1987.

4. Ilay Cooper and Barry Dawson. Traditional buildings of India, Thames and Hudson Ltd., London. 1998.

5.Kulbushanshan Jain and Minakshi Jain. Mud Architecture of the Indian Desert, Aadi Centre, Ahmedabad. 1992.

6. Glassie H.H., "Vernacular Architecture " Indiana University Press.2000

7. Heath, Kingston wm- 'Vernacular Architecture and Regional design'- Cultural process and environmental response- 'Elsevier science and technology'- 30 April 2007

8. Henry H. Glassie- 'Vernacular architecture'- Pan books, London- 1966

9. Lindsay Asquith, Marcel Vellinga, Taylor and Francis- 'Vernacular architecture in the Twenty first century'- 2006 USA