Dr YSR Architecture and Fine Arts University

School of Planning and Architecture (SPA)

B. Arch (Bachelor of Architecture)

R21

Course Structure and Syllabus

Aim

Making Architecture a Thriving, Adaptable Course through Course-centred Education and Hands-on Practices to understand its Implications.

Vision

To create a favourable educational environment that places a high emphasis on creativity, research, quality, and strategic partnerships that are based on values and commitment to society.

Mission

- To foster creativity and innovation by creating an ecosystem that encourages learning and world-class research.
- To engage in activities that contribute to the advancement of society.
- To equip students to deal with the complexities of current demands while also promoting inquiry, creativity, and creative experimentation in constructing the living environment.
- To empower students by providing Architectural experience in diverse fields with ethics, values, and social responsibility

PEO – Program Educational Objectives

PEO I	Graduates will exhibit competencies in personal engagements, research, and higher education by applying knowledge and innovative efforts in Architecture and Allied fields (Skill)
PEO II	Graduates will strengthen their intellectual growth guided by the principles of sustainable development and global inter competitiveness and will understand how Architectural projects will affect Society and Environment (Employment)
PEO III	Graduates will exhibit Architectural Services through adaptability, Flexibility, communication skills, Team spirit, Ethical conduct, and Leadership Qualities (Skills)
PEO IV	Graduates will engage in lifelong learning, Career enhancement, Research oriented Practise with critical thinking and inter disciplinary approach to change in Global and Local Needs (Entrepreneurship)

PO's – Programme Outcomes

PO1	**Design Knowledge** Ability to gain Knowledge in Arts, Humanities, Engineering, Technology and Architecture and Application of Knowledge in the Architectural Practise
PO2	**Problem Analysis** Usage of the Basic Elements and Principles of Architecture and Engineering and also gaining the ability to identify, define and analysis of problems in the Built environment
PO3	**Design Solutions** Able to utilize freehand drawing, Architectural graphics, and Modern building skills and apply the theoretical knowledge to the design solutions that meet the specific needs the appropriate considerations of the public, cultural, societal, and environmental considerations
PO4	**Investigations for Complex Problems** An ability to use research-based knowledge and research methods including design of various typologies of the built form, analysis of the data and interpretation of the data, review, comprehend and report on the technological and design developments happening in the field of Architecture
PO5	**Modern Tools** Create, Select, and Apply the appropriate tools and techniques resources and modern design activities including the life cycle of the project and modelling to the complex design solutions
PO6	**Profession and Society** An ability to identify and solve the Design's addressing Social, Economic, and Cultural issues in Architectural Design
PO7	**Environment and Sustainability** To help people comprehend the existing Environmental outcomes to achieve the best possible results and incorporate Building and Safety norms to facilitate a sustainable built fabric. To understand structural stability and its derivatives
PO8	**Ethics** Engage the process of Designing and Building environment work forces in the correct direction in the disclose of Social, Ethical and Professional responsibility
PO9	**Individual / Teamwork** Involve students in individual/group activities so that teamwork becomes a natural part of their job, resulting in comfortable outcomes in whichever specialities. Ability to work cooperatively with architectural teams and other multidisciplinary design teams in the Architecture fraternity
PO10	**Communication** Develop the communication through drawn visual, verbal, and written representations of the Architectural Proposition of their Cultural, Professional and Technical Implications.
PO11	**Project Management and Finance** Understand all the financial implications and feasibility involved in Architecture Procedures and understand Managing concepts involving all the stakeholders involved in Project Executions
PO12	**Lifelong Learning** For a constantly expanding global viewpoint, build and nurture links with front-line national/international educational/research institutions and the ability to engage in independent and lifelong learning

Correlation between PO's and PEO's

PEOs	Programme Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
I	✓	✓	✓		✓			✓				✓
II			✓		✓	✓	✓	✓		✓	✓	✓
III	✓	✓		✓				✓	✓	✓	✓	
IV	✓			✓	✓	✓	✓		✓		✓	✓

PSO's – Program Specific Outcomes

PSO1: Identify, Analyse, Design & Develop solutions to the Architectural Design problems of society and the environment.

PSO2: To understand the complexity of Architectural problems and solutions to them by using appropriate techniques and technologies.

PSO3: Graduates will have incremental skills to enhance their employability and entrepreneurship in Architecture and its allied fields.

PSO4: Able to manage the practice with interdisciplinary skills and approaches.

COURSE STRUCTURE

SEMESTER I

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam S/T/P/J
			L	S	P		Int	Ext	Total	
PC	AR21B1S1	Basic Design	1	8	0	9	50	50	100	J
PC	AR21B1S2	Architectural Drawing and Graphics – I	1	3	0	4	50	50	100	S
BS&AE	AR21B1S3	Building Materials and Construction – I	1	3	0	4	50	50	100	S
BS&AE	AR21B1C1	Structural Mechanics - I	3	0	0	3	50	50	100	T
PC	AR21B1C2	Art Studio & Photography	0	0	2	2	50	50	100	J
PC	AR21B1C3	Introduction to Art and Architecture	2	0	0	2	50	50	100	T
PC	AR21B1P1	Workshop – Carpentry & Model Making	0	0	4	4	50	0	50	No End Exam
SEC	AR21B1G1	Environmental Studies	2	0	0	2	50	50	100	W
		Total	**11**	**14**	**5**	**30**	**400**	**350**	**800**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core (PC)	21
Building Sciences and Applied Engineering (BS and AE)	7
Skill Enhancement Courses (SEC)	2
Total Credits of Semester -I	**30**

SEMESTER II

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B2S1	Architectural Design – I	1	8	0	9	50	50	100	J
PC	AR21B2S2	Architectural Drawing and Graphics – II	1	3	0	4	50	50	100	S
BS&AE	AR21B2S3	Building Materials and Construction – II	1	3	0	4	50	50	100	S
BS&AE	AR21B2C1	Structural Mechanics - II	3	0	0	3	50	50	100	T
PC	AR21B2C2	History of Architecture - I	3	0	0	3	50	50	100	T
BS&AE	AR21B2C3	Surveying and levelling	2	0	1	3	50	50	100	T
PC	AR21B2C4	Theory of Architecture and Design	2	0	0	2	50	50	100	T
SEC	AR21B2G1	Communication Skills	1	0	1	2	50	50	100	T
	MC21B202	Value Education	1	0	0	Self-Learning				
		Total	**13**	**14**	**3**	**30**	**400**	**400**	**800**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core (PC)	18
Building Sciences and Applied Engineering (BS and AE)	10
Skill Enhancement Courses (SEC)	2
Total Credits for Semester -II	**30**

SEMESTER III

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B3S1	Architectural Design –II	1	8	0	9	50	50	100	J
BS&AE	AR21B3S2	Building Materials and Construction – III	1	3	0	4	50	50	100	S
BS&AE	AR21B3C1	Structural Mechanics – III	3	0	0	3	50	50	100	T
PC	AR21B3C2	History of Architecture - II	3	0	0	3	50	50	100	T
PC	AR21B3C3	Building Services - I	3	0	0	3	50	50	100	T
PC	AR21B3C4	Site Analysis and Site Planning	3	0	0	3	50	50	100	T
BS&AE	AR21B3C5	Climatology	3	0	0	3	50	50	100	T
PC	AR21B3C6	Applied Ergonomics	2	0	0	2	50	50	100	T
	MC21B301	Indian Constitution	1	0	0	Self-Learning				
		Total	**14**	**11**	**5**	**30**	**400**	**400**	**800**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	20
Building Sciences and Applied Engineering (BS and AE)	10
Total Credits for Semester -III	**30**

SEMESTER IV

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B4S1	Architectural Design – III	1	8	0	9	50	50	100	J
BS&AE	AR21B4S2	Building Materials and Construction – IV	1	3	0	4	50	50	100	S
BS&AE	AR21B4C1	Design of Structures - I	2	0	1	3	50	50	100	T
PC	AR21B4C2	History of Architecture - III	3	0	0	3	50	50	100	T
BS&AE	AR21B4C3	Building Services – II	3	0	0	3	50	50	100	T
PC	AR21B4C4	Landscape Architecture	2	0	1	3	50	50	100	T
PC	AR21B4C5	Cultural Architecture	2	0	0	2	50	50	100	T
SEC	AR21B4C6	Digital Studio - I	0	0	3	3	50	50	100	P
	MC21B302	Essence of Indian Traditional Knowledge	1	0	0	Self-Learning				
		Total	**14**	**11**	**5**	**30**	**400**	**400**	**800**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	17
Building Sciences and Applied Engineering (BS and AE)	10
Skill Enhancement Courses (SEC)	3
Total Credits for Semester -IV	**30**

SEMESTER V

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B5S1	Architectural Design –IV	1	5	0	6	50	50	100	J
PC	AR21B5S2	Architectural Conservation	1	3	0	4	50	50	100	J
BS&AE	AR21B5C1	Design of Structures - II	2	0	1	3	50	50	100	T
PC	AR21B5C2	History of Architecture - IV	3	0	0	3	50	50	100	T
PC	AR21B5C3	Human Settlements & Town Planning	3	0	0	3	50	50	100	T
SEC	AR21B5C4	Digital Studio -II	0	0	3	3	50	50	100	P
PE	AR21B5E1	Vernacular Architecture	2	0	0	2	50	50	100	T
	AR21B5E2	Universal Design								
OE	AR21B5O1	Art & Design paradigm (Open Elective)	2	0	0	2	100	0	100	No End Exam
SEC	AR21B5CSP	Community Service Project	0	0	4	4	100	0	100	No End Exam
		Total	**14**	**8**	**8**	**30**	**550**	**350**	**900**	
Community Service Project like village development plans and documentation should be an integral part of the Architectural Design as an assignment.										

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	16
Building Sciences and Applied Engineering (BS and AE)	3
Professional Electives (PE)	2
Open Electives (OE)	2
Skill Enhancement Courses (SEC)	7
Total Credits for Semester -V	**30**

SEMESTER VI

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B6S1	Architectural Design –V	1	9	0	10	50	50	100	J
PC	AR21B6S2	Working Drawing and Details	1	3	0	4	50	50	100	J
PC	AR21B6C1	Building Estimation, Costing and Specifications	2	0	1	3	50	50	100	T
PC	AR21B6C2	Housing	3	0	0	3	50	50	100	T
BS&AE	AR21B6C3	Advanced Construction Technology & Structural Systems	3	0	0	3	50	50	100	T
BS&AE	AR21B6C4	Architectural Acoustics and Lighting	2	0	0	2	50	50	100	T
PE	AR21B6E1	Green Buildings	2	1	0	3	50	50	100	T
	AR21B6E2	Interior Design								
OE	AR21B6O1	Digital skills for Design (Open Elective)	2	0	0	2	100	0	100	No End Exam
		Total	**12**	**13**	**5**	**30**	**450**	**350**	**800**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	20
Building Sciences and Applied Engineering (BS and AE)	5
Professional Electives (PE)	3
Open Electives (OE)	2
Total Credits for Semester -VI	**30**

SEMESTER VII

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B7S1	Architectural Design –VI	1	11	0	12	50	50	100	J
BS&AE	AR21B7C1	Advanced Building Services	3	0	0	3	50	50	100	T
PC	AR21B7C2	Urban Design	4	0	0	4	50	50	100	T
BS&AE	AR21B7C3	Environment Science for Architecture	3	0	0	3	50	50	100	T
PE	AR21B7E1	Tall Buildings	2	1	0	3	50	50	100	T
	AR21B7E2	Architectural Journalism and Photography								
SEC	AR21B7G1	Personality Development	1	0	2	3	50	50	100	J
OE	AR21B7O1	Industrial Building Systems (Open Elective)	2	0	0	2	100	0	100	No End Exam
		Total	**12**	**13**	**5**	**30**	**400**	**300**	**700**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	16
Building Sciences and Applied Engineering (BS and AE)	6
Professional Electives (PE)	3
Open Electives (OE)	2
Skill Enhancement Courses (SEC)	3
Total Credits for Semester -VII	**30**

SEMESTER VIII

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam
			L	S	P		Int	Ext	Total	S/T/P/J
PC	AR21B8S1	Architectural Design - VII (Urban Design)	2	10	0	12	50	50	100	J
BS&AE	AR21B8C1	Structures Project	2	1	0	3	50	50	100	J
PE	AR21B8E1	Disaster Mitigation & Management	2	1	0	3	50	50	100	T
	AR21B8E2	Intelligent Buildings								
PE	AR21B8E3	Furniture and Product Design	2	1	0	3	50	50	100	J
	AR21B8E4	Building Information Modelling								
PAECC	AR21B8C1	Project Management	3	0	0	3	50	50	100	T
PAECC	AR21B8C2	Dissertation	1	0	3	4	50	50	100	J
OE	AR21B8O1	Open Elective (MOOCS)	2	0	0	2	100	0	100	No End Exam
		Total	**12**	**13**	**5**	**30**	**400**	**300**	**700**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Open elective: Minimum 8 weeks course through MOOCS

Category	Credits
Professional core -PC	12
Building Sciences and Applied Engineering (BS and AE)	3
Professional Electives (PE)	6
Open Electives (OE)	2
Professional Ability Enhancement Compulsory Courses (PAECC)	7
Total Credits for Semester -VIII	**30**

SEMESTER IX

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam S/T/P/J
			L	S	P		Int	Ext	Total	
PAECC	AR21B9PT	Practical Training	0	0	30	30	50	50	100	J
		Total	**0**	**0**	**30**	**30**	**50**	**50**	**100**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional Ability Enhancement Compulsory Courses (PAECC)	30
Total Credits for Semester -IX	**30**

SEMESTER X

Category	Course Code	Course Title	Periods per Week			Credits	Marks			End Exam S/T/P/J
			L	S	P		Int	Ext	Total	
PC	AR21B10TH	Design Thesis	2	22	0	24	50	50	100	J
PAECC	AR21B10C1	Professional Practice & Building Codes	3	0	0	3	50	50	100	T
SEC	AR21B10C2	Entrepreneurship Skills for Architects	3	0	0	3	50	50	100	T
		Total	**8**	**22**	**0**	**30**	**150**	**150**	**300**	

Note: S – Studio, T-Theory, P- Practical (all practical exams will be followed by viva - voice), J-Jury

Category	Credits
Professional core -PC	24
Professional Ability Enhancement Compulsory Courses (PAECC)	3
Skill Enhancement Courses (SEC)	3
Total Credits for Semester -X	**30**

B.Arch. - Total Credits: 300

Semester-wise Weightage in terms of Credits Category							
Semester	**PC**	**BS&AE**	**Electives**		**PAECC**		**Total Credits**
			PE	**OE**	**PAECC**	**SEC**	
I	21	7				2	30
II	18	10				2	30
III	20	10					30
IV	17	10				3	30
V	16	3	2	2		7	30
VI	20	5	3	2			30
VII	16	6	3	2		3	30
VIII	12	3	6	2	7		30
IX					30		30
X	24				3	3	30
Total	164	54	14	8	40	20	300
Percentage	54.66	18.00	4.66	2.67	13.33	6.66	100.00

Professional core **(PC),** Building Sciences and Applied Engineering **(BS and AE)**
Professional Electives **(PE),** Open Electives **(OE),** Skill Enhancement Courses **(SEC)**
Professional Ability Enhancement Compulsory Courses **(PAECC)**

S.No	Category	No of Credits	% of credits	Suggested Breakup credits by CoA,2020 Guidelines
1	Professional core -PC	164	54.66	50
2	Building Sciences and Applied Engineering (BS and AE)	54	18.00	20
3	Professional Electives (PE)	14	4.66	10
4	Open Electives (OE)	8	2.67	5
5	Professional Ability Enhancement Compulsory Courses (PAECC)	40	13.33	10
6	Skill Enhancement Courses (SEC)	20	6.66	5
	Total	300	100	100

Assessment Details

Architectural Design Studios

Internal Marks-The Internal marks of the studio have to be evaluated through both summative as well as formative assessments such as continuous Internal assessment, Sem in Reviews and Attendance.
The Continuous internal Assessment contains Studio Discussions, Periodical reviews, Time Problems, Presentations, and Micro projects.

The Studio faculty has to decide the topic for the design and seminar, if at the beginning of the semester only. The faculty have to announce the percentage of marks for every criterion. Such as the Conceptual stage, development stage, design stage and presentations.

Every semester the student has t perform one major design and one minor design where major design carries 60% of the marks and minor design carries 40% of the total internals.

External Marks - The student needs to submit his/her work done throughout the semester, including rough sheets for the Viva examination, at least one day before the Viva work examination to the course teacher/coordinator. The Viva-voce will be evaluated by an external teacher appointed by the University along with the Course teacher or an internal examiner.

Theory cum Studios

Internal Marks -The Internal Marks of theory cum studio subjects' evaluation will be evaluated through both summative as well as formative assessments such as continuous Internal assessment, Sem in test Submission of construction drawing sheets, Journal of materials, Multiple Choice Questions, Quizzes, Open book tests, Seminar, or micro project.
The Faculty have to announce marks for every criterion in a detailed manner. For Building Materials and construction, a minimum of 60% of the internals should be allotted the Drawing sheets and portfolio and a minimum of two tests have to be conducted for the theory part.
Whereas for Architectural drawing and graphics, a minimum of 70% of the internals should be allotted to the drawing sheets and portfolio.
Whereas for the other subjects, a minimum of 50% of the internals should be evaluated through formative assessments and the remaining through summative assessments (Sem in exams).

External Marks- The student has to undergo a written cum drawing test as prescribed by the university schedule for five hours.

Theory Subjects

Internal Marks -The Internal Marks of theory subjects will be evaluated through both summative as well as formative assessments such as Internal exams, MCQ, Quizzes, Open book tests, seminars or micro-projects, Assignments and Any other Alternative Learning Methods.

Summative Assessment: A minimum of Two internal exams need to be conducted for 30 marks each for two hours each.

Formative Assessment: Minimum two assignments need to be conducted for the subject, Group discussion/Seminar/quiz/ALM's any one of them suitably planned to attain the COs and Pos has to be conducted minimum one per CO and attendance.
Out of the total internal marks, a minimum of 40% should be a Summative assessment and a maximum of 60% can be considered whereas the other will be a formative assessment.

External Marks- Theory Semester end exam will be conducted by the University as per the scheduled timetable, with common question papers for the subject (duration 03 hours) which will be evaluated for external marks.

Practical Subjects **(Digital Studios)**

Internal Marks -The Internal Marks of practical subjects' evaluation will be evaluated through both summative as well as formative assessments such as continuous progress, periodical review of works, Sem in exams and attendance. A minimum of one internal exam needs to be conducted for 20 marks each for three hours and the remaining needs to be marked Continue progress of the work, Drawing sheets and portfolio of work and attendance.

External Marks - Semester end exam will be conducted by the University as per the scheduled timetable, with a question paper for the subject (duration 03 hours) which will be evaluated for external marks.

FIRST SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1S1	BASIC DESIGN	1	8	0	9	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the basic concepts of Design in Architecture	1,2,3,9, 10,12	2,5,6
CO2	To understand the elements and principles of design, Application of elements and principles of composition in two-dimensional compositions and other exercises.	1,2,3,9, 10,12	2,5,6
CO3	To study form generation and the principles of composition-using grids, etc.	1,2,3,9, 10,12	2,5,6
CO4	To understand the concepts of geometry and explore the exercises in three-dimensional spaces	1,2,3,9, 10,12	5,6
CO5	To understand the concepts of colour theory, psychological factors and applying them to design concepts.	1,2,3,9, 10,12	5,6
CO6	To understand and create the design compositions in semi-enclosed spaces	1,2,3,9, 10,12	5,6

MODULE – I

Basic Design provides the framework for understanding design by sensitizing students to the conceptual, visual, and perceptual issues involved in the design process, through exercises in design concepts, simple two-dimensional and three-dimensional compositions etc.

The course prepares the ground for the students to gain an understanding of the fundamental issues in design and develop the skill to create solutions for simple elements of the building.

MODULE – II

ELEMENTS AND PRINCIPLES OF DESIGN: point, line, shape, form, space, texture, value, colour, and material; Introduction to principles of design: unity, balance, symmetry, asymmetry, proportion, scale, and proportion, hierarchy, rhythm, contrast, harmony, focus, movement, direction, gradation, repetition, etc. Application of elements and principles of composition in two-dimensional compositions and other exercises.

MODULE – III

COMPOSITIONS IN TWO DIMENSIONS: shapes and patterns; use of grids in creating repetitive patterns; Principles of composition-using grids, symmetrical /asymmetrical, rule of thirds, Centre of interest, etc. Form generation through addition & subtraction, Anomaly, Positive & Negative spaces, Solid and Voids. Developing compositions in two-dimensional designs like- logos, cover pages, collages, murals, floor patterns, grills, railings, gates, etc.

MODULE – IV

CONCEPTS OF GEOMETRY: Different three-dimensional forms, primitive forms, and understanding the behaviour when combined- Transformations to three-dimensional forms; Explorative exercises in three-dimensional compositions.

Making three-dimensional sculptures involving basic platonic solids and abstract sculptures using various techniques/ materials. (Ex: POP, wire/ matchstick, soap, clay, etc.)

MODULE – V

COLOUR THEORY: Colour theory, color wheel, primary, secondary, tertiary colors, color schemes, color value and intensity, color coding systems, and psychological factors governing the choice of color schemes in architecture. Theoretical inputs are to be followed by exercises to develop the ability to translate abstract principles into two- and three-dimensional compositions.

MODULE – VI

Design of non-enclosed objects. e.g. park seat, push-cart, built-in furniture, etc. Developing compositions in semi-enclosed spaces- entrances, gateways, portals, compound walls, etc.

REFERENCE BOOKS

1. Wucius, Wong. Principles of Two-Dimensional Design. Van Nostrand Reinhold 1972.
2. Maier Manfred Basic Principles of Design, Vol.1, 2, 3 & 4, Van Nostrand Reinhold, NY. (1977)
3. Ching, Francis D.K. Architecture: Form, Space, and Order, 2nd ed. Van Nostrand Reinhold, New York, 1996.
4. Hanks, A. David. Decorative Designs of Frank Lloyd Wright, Dover Publications, Inc. New York, 1999.
5. Hepler, E. Donald, Wallach, I. Paul. Architecture Drafting and Design, 3rd ed. McGraw-Hill Book Company, New York, 1977.
6. Itten, Johannes. Design and Form: The basic course at the Bauhaus, Thames and Hudson Ltd., London 1997.
7. Krier, Rob. Architectural Composition, Academy Editions, London, 1988.
8. Meiss, Pierre Von. Elements of Architecture: From Form to place, E and FN Spon, London, 1992.
9. Pipes, Alan. Drawing for 3-Dimensional Design. Thames and Hudson Ltd., London 1990.
10. Shibikawa, Ikuyoshi and Takahashi, Yumi. Designers Guide to Colour.
11. Smithies, K.W. Principles of Design in Architecture. Chapman and Hall, 1983.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1S2	ARCHITECTURAL DRAWING AND GRAPHICS – I	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the fundamentals of drawing and creating the simple exercises in drafting	2,3,4,5, 9,10,12	2,5
CO2	To understand typography and make simple exercises out of it.	2,3,4,5, 9,10,12	2,5
CO3	To study the Geometrical constructions involving various drafting techniques; regular shapes using T-squares, and set squares.	2,3,4,5, 9,10,12	2,5
CO4	To understand the scales, drawings and sections of solids and the development of surfaces.	2,3,4,5, 9,10,12	2,5
CO5	To understand the concepts of freehand sketching and creating the Indoor and Outdoor sketching of built and natural forms	2,3,4,5, 9,10,12	2,5
CO6	To study and apply the concepts of Orthographic projection in architectural built elements and built forms	2,3,4,5, 9,10,12	2,5

MODULE – I

INTRODUCTION: Fundamentals of drawing and its practice, introduction to drawing equipment, familiarization, use, and handling. Drawing sheet sizes, layouts, and composition. Simple exercises in drafting, line types, line weights; dimensioning, use of scale & conversion

MODULE – II

TYPOGRAPHY: Anatomy of Type, Styles, Roman and Gothic style lettering; freehand lettering, title panels, and legends.

MODULE – III

GEOMETRICAL CONSTRUCTION:

Introduction to Plane geometry – Exercise in the construction of Straight lines, Circles, Tangents and Regular Polygons

Description of Plane Curves: Ellipse, Parabola and Hyperbola.

Solid Geometry: Simple Projections ‑ Projection of solids ‑ Developments

MODULE – IV

MEASURING AND DRAWING TO SCALE:

Understanding of different scales and their uses in practice - Drawings to scale. Examples of Measured drawing - Furniture, Classroom plan, Doors, Windows, Entrance Gates, buildings etc.

MODULE – V

FREEHAND DRAWINGS: Line strokes, light and shade techniques of simple, natural, and 3D geometric forms. Study of proportions and scale; structure and axes of objects; Indoor and Outdoor sketching of built and natural forms: Still life, furniture, etc.

MODULE – VI

ISOMETRIC & AXONOMETRIC:

Isometric View: Isometric Views of Objects, and building components such as Steps, Canopy etc.

Axonometric view: Axonometric view of objects, etc.

NOTE: This is a studio subject and students should be made to prepare drawings as studio exercises along with the theoretical inputs. The studio work should be supplemented with appropriate site visits. Each topic should have drawing plates

TEXTBOOKS

1. M.S.Kumar, Engineering Drawing, DD publications, Chennai 600 048
2. 2. Francis D.K.Ching &Steven P Juroszek, Design drawing, John Wiley & Sons, USA, 1998

REFERENCE BOOKS

1. Ching, F. D. K. (2011). A Visual Dictionary of Architecture. 2nd, Ed. John Wiley & Sons.
2. Martin, L. C. (1970). Architectural Graphics. 2nd Ed. Macmillan Pub Co.
3. Morris, I. H. (1902). Geometrical Drawing for Art Students. Longmans.
4. Lockard, W. K. (1992). Drawing as a Means to Architecture. 6th Ed. New York : Van Nostrand Reinhold Company.
5. Zell, Mo. (2008). The Architectural Drawing Course. 1st Ed. Thames and Hudson.
6. Moris, I.H. Geometrical Drawing for Art Students.
7. Thoms, E. French. Graphic Science and Design, New York: MC Graw Hill.
8. Nichols, T.B. and Keep, Norman. The Geometry of Construction, 3rd ed. Cleaver – Hume Press Ltd., London, 1959.
9. Gill, P.S. T.B. of Geometrical Drawing, 3rd ed. Dewan Suhil Kumar Kataria, Ludhiana, 1986.
10. Shah, M.G., Kale, C.M. and Patki, S.Y. Building Drawing: with an integrated approach to the built environment, 7th ed. Tata McGraw Hill Pub., Delhi, 2000.
11. Bies, D. John. Architectural Drafting: Structure and Environment. Bobbs – Merrill Educational Pub., Indianapolis.
12. Nelson, A. John. H.B. of Architectural and Civil Drafting, Van Nostrand Reinhold, New York, 1983.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1S3	BUILDING MATERIALS AND CONSTRUCTION - I	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the building materials Bricks and Clay	1,7,10	2
CO2	To understand the building materials rock and stone	1,7,10	2
CO3	To understand the components of a building and the nuances of drawing plan, Elevation, and sections along with relevant sketches and details showing the method of construction	1,3,5,10	2
CO4	To understand the importance and apply these types of brickwork and stone works in construction.	1,3,5,10	3
CO5	To understand and apply the construction techniques of Lintels and Arches	1,3,5,10	3
CO6	To understand the building materials Masonry, Cladding and Basement and application of those materials.	1,3,5,10	3

MODULE – I

BRICKS AND CLAY: Fundamentals and types of soil. Bricks: Composition of good bricks, properties and uses of bricks, classification of bricks, the shape of bricks, firebricks, and substitutes for bricks.
Clay products: Tiles, terracotta, stoneware, earthenware, porcelain, and clay block their properties and uses.

MODULE – II

ROCKS AND STONE: Geological Classification of rocks –test for stones, uses of stones, deterioration of stones, preservation of stones, stones available for construction in India, their properties and uses. Stones for finishes –cutting & polishing. Artificial stones and their uses.

MODULE – III

BASIC BUILDING COMPONENTS: Cross section of a small building to understand foundation, plinth beam flooring, sill, lintel, roof beam and slabs parapet & weathering course
Foundation: typical types of foundation in stone, brick & RCC.
Walls: Details of walls section across the opening (door & window)
Roofs: simple configurations and details of various forms of roofs (flat, sloped, pyramidal & dome)

MODULE – IV

BRICKWORK: Various types of bonds, stopped ends, junctions, piers, jambs, footings, foundations, corbelling, damp proof course, windowsills, thresholds, copings, mortar joints and pointing.

Stone masonry: stone walls, rubble work, ashlar work, masonry joints, windowsills, plinth, cornices, and surface finishes.

MODULE – V

LINTELS: Lintels of wood, stone, and brick.
Arches: arches; terms defined; various forms of arches like segmental, semi-circular, elliptical, three-centred, flat and relieving arch, etc.
Types of brick roofs, Madras terrace roof, jack arch roof, brick arches and domes, reinforced brick roofs Types of arches, vaults and domes, and construction of arches, vaults and domes

MODULE – VI

COMPOSITE MASONRY: Brick-backed ashlar, rubble-backed ashlar, concrete-backed masonry, ashlar-faced concrete walls, marble-faced masonry; tile-faced concrete, hollow block masonry.

Cladding: Cladding of various materials-marble, granite, slate, tiles, metal etc.

Basement: Damp proofing, different types of damp proof materials, their compositions and application, Constructional details of walls, floors, foundations etc. with respect to their damp proofing and natural ventilation.

TEXTBOOKS

1. W.B. Mickay – Building Construction Vol 1 and 3 – Longmans, UK 1981
2. S.C.Rangwals – Engineering materials – Charotar Publishing, Anand
3. Dr B.C Punmia – Building Construction

REFERENCE BOOKS

1. Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2. Bindra,S P.and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3. Hailey and Hancork, D.W. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
5. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1C1	STRUCTURAL MECHANICS – I	3	0	0	3	50	50	100

Cos	Course Outcomes	POs	BTLs
CO1	To understand the importance and role of structures in architecture.	1,7, 8	1, 2
CO2	To understand the various force systems and apply theories to calculate the resulting forces	1,7,8	1, 2
CO3	To understand and apply the concepts of centre of gravity and moment of inertia for various sections	1,7,8	1, 2,3
CO4	To be familiar with various types of trusses and evaluate the support reactions.	1,7,8	1, 2, 3
CO5	To Analyse the stresses and strains in a member subjected to various loads	1,7,8, 10	1, 2
CO6	To understand the concept of volumetric strain and the relationship between the elastic constants,	1,7,8, 10	1, 2, 3

MODULE – I

STRUCTURES IN ARCHITECTURE

Introduction to structure, Form and Architecture, The role of structure in architecture, Structural Transformation in Architectural History. Structure in Nature: Reading Structure in Natural Forms - Plants, Animals, Insects.

Examples of Synthesis of Architectural and Structural Forms.

MODULE – II

FORCES AND MOMENTS

Types of force systems, resultant of forces -lami's theorem- Varignon's theorem-principle of equilibrium-simple problems

MODULE – III

SECTION PROPERTIES

Definition of Centroid, Moment of Inertia, line of symmetry, centroid and Moment of Inertia for shapes like rectangular, circular, triangular, L, T, C, I Sections-simple problems.

MODULE – IV

TRUSSES

Introduction to determinate and indeterminate plane trusses- analysis of simply supported and cantilever trusses by method of joints (simple problems)

MODULE-V

STRESSES AND STRAINS

Introduction -Types of stresses and strains- Hook' law, the stress-strain curve for Mild steel, and concrete. Principle of superposition - Elongation of bars of varying cross sections, and Composite bars, (simple problems)

MODULE – VI

ELASTIC CONSTANTS

Poisson's ratio, types of elastic constants and their relationships - Simple Numericals- volumetric strain under uniaxial, biaxial, and triaxial loading. (simple problems)

TEXTBOOKS

1. Bansal, R., & Bansal, S. (2015). Engineering Mechanics. New Delhi: Laxmi Publications (P) Ltd.
2. Bjorn N Sandekar et al, The structural basics of Architecture – 2 nd edition, Routledge, Newyork, 2011.
3. Mario Salvadori, Robert Heller, Structure in Architecture, Prentice International Series in Architecture, New Jersey, 1963.
4. STRUCTURES - Martin Bechthold, Daniel L Schodek, and PHI Learning Private limited, Sixth Edition
5. Curt Siegel, Structure and Form in Modern architecture, Reinhold publishing corporation, Newyork, 1962.
6. Rowland J. Mainstone, Developments in Structural form, Architectural press, Oxford, 1975.
7. Structure and Design, by G. G. Schierle
8. Strength of Materials – R K Bansal, Laxmi Publications, New Delhi, 3rd ed'
9. I B Prasad , Applied Mechanics & Strength of Materials
10. G G Schierle, Architectural Structures, University of Southern California Custom Publishing C/O Chauncey Jemes Los Angeles
11. Angus J. Macdonald, Structure and Architecture, University of Edinburgh, Second edition

REFERENCE BOOKS

1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.
4. Schierle, G. (2008). Structure and Design. University Readers.
5. Schodek, D., & Bechthold, M. (2013). Structures. Pearson; 7th Edition.
6. Singer, F. (1975). Engineering Mechanics. Weather hill: Harper & Row, 3rd Edition

Assessment: *Internal Marks will be evaluated based on Mid-term Examinations and Assignments.*

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1C2	ART STUDIO & PHOTOGRAPHY	0	0	2	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the different types of arts, and sketches and to understand drawing from inspiration	1,3,9, 10	3,6
CO2	To understand the concepts of colours and implement them in painting	1,3,9, 10	3,6
CO3	To study the rendering techniques and implement them in the indoor and outdoor sketching	1,3,9, 10	3,6
CO4	To understand the history of photography, the anatomy of the camera	1,3,9, 10	3,6
CO5	To understand the principles of Visualization, Explore the Principles of Design	1,3,9, 10	3,6
CO6	To study photo editing techniques and software	1,3,9, 10	3,6

MODULE – I

DRAWING: Introduction to art – Types of drawing – Visual effects of drawing– Composition – Approach to sketching – Study of light, shade and shadow. Exercise involving Indoor and outdoor sketching – Spot sketching- Sketching Human figures & Objects– Sketching Vegetation - Drawing from imagination – Study of 3-D effects – Tools and materials – Illustration.

MODULE – II

PAINTING I: Introduction of painting– Properties of colour – Colour schemes – Types of colours - Application and visual effects of colour. Exercise involving Study of colour – Properties of paper, brush and other tools – Basic washes.

MODULE – III

PAINTING II: Indoor and outdoor painting – Rendering techniques Exercise involving various mediums of colour– Pen and ink– Mixed mediums – Study of multi-colour and 3D effects from nature and the built environment.

MODULE – IV

PHOTOGRAPHY BASICS: Understand Photography basics, History, Anatomy of a camera, Creative understanding of light sources, and Light angles.

MODULE – V

PHOTOGRAPHY VISUALIZATION: Understand the Principles of Visualization, Explore the Principles of Design, Perspective study, Creative understanding of elements of composition, Analysing further into the strongest element of design

MODULE – VI

PHOTOGRAPHY PROCESSING: Introduction to photo editing software and its uses, working with tools & menus, Working with layers, Working with filters/special effects.

TEXTBOOKS

1. Webb, Frank, “The Artist guide to Composition”, David & Charles, U.K., 1994.
2. Ching Francis, “Drawing a Creative Process”, Van Nostrand Reinhold, New York, 1990.
3. Alan Swann, “Graphic Design School”, Harper Collins, 1991.
4. Barrington Barber, "Fundamentals of Drawing: A Complete Professional Course for Artists", Arcturus Publishing Ltd, 2 edition (5 September 2003).

REFERENCE BOOKS

1. Moivahuntly, “The artist drawing book”, David & Charles, U.K., 1994.
2. Arundell (Jan) Exploring sculpture, Mills and Boon, London/Charles, T. Brand Ford Company, U.S.A.
3. The art of drawing trees, heads, colours, mixing, drawing, landscape and painting, water colour, oil colour, etc. – The Grumbacher Library Books, New York, 1996.
4. Caldwell peter, “Pen and Ink Sketching”, B.T. Bats ford Ltd., London, 1995.
5. Arthur L. Guptill, "Drawing and Sketching in Pencil", Dover Publications Inc.; Dover Ed edition (9 November 2007)

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1C3	INTRODUCTION TO ART AND ARCHITECTURE	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the purpose and relevance of art, Art consciousness, basic characteristics, and development as an expression of culture	1,8,10	2
CO2	To study the development of art from the prehistoric period to the present times	1,8,10	2
CO3	To understand the exploration of art forms and the relationship between art and architecture	1,8,10	2
CO4	To study and understand the role of an Architect in a project	1,8,10	2
CO5	To understand the evolution of shelter forms in regions of the world and examples	1,8,10	2
CO6	To understand the design ideologies	1,8,10	2

MODULE – I

PURPOSE AND RELEVANCE OF ART, ART CONSCIOUSNESS: Aesthetics, perception, symbolism, expression, style, fashion, appropriateness, and values. Understanding works of art. Its role meaning and purpose in terms of basic characteristics and development as an expression of culture

MODULE – II

DEVELOPMENT OF ART: A survey of the history of art forms; pre-historic period to the present times; Changing nature of art through time in terms of content; form and material

MODULE – III

EXPLORATION OF ART FORMS: Role and meaning of art-various types of arts - fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art, etc. Nature and characteristics of art forms such as Painting, Sculpture, Architecture, Photography, and Almost Art; Nature and characteristics of art forms such as Dance, Drama, Music, Film, and Literature Relationship between art and architecture from the earliest times.

MODULE – IV

DEFINITIONS AND A GENERAL UNDERSTANDING OF ARCHITECTURE: Role of the architect in a building project. The changing role of architects, their relationship with other consultants, contractors, and clients, technical knowledge, and other skills are required as inputs. Various subjects to be learned by architecture students, and their relevance to practice.

MODULE – V

FACTORS INFLUENCING ART FORM: Various factors influence the architecture of a region, Architecture is a response to social, technological, and environmental forces. Evolution of shelter forms in regions of the world and examples of vernacular architecture in the world, with particular reference to India

MODULE – VI

UNDERSTANDING IN DETAIL ABOUT DESIGN – Concepts, Ideas and Notions and explain how the design thinking process will evolve by the end of the Architecture course at each stage. Understanding of Design ideologies such as – Analogical, Metaphor, Programmatic, Essence and Idealistic.

REFERENCE BOOKS

1. Craven, C. Roy. Indian Art a Concise History.
2. Kumar, Raj (Ed.). Essays on Indian Art and Architecture. Discovery Pub., New Delhi, 2003.
3. Fisher, E. Robert. Buddhist Art and Architecture. Thames and Hudson, London, 1993.
4. Ghosh, A (Ed.). Jain Art and Architecture Vol. 1-3. Bharatiya Jnanpith, New Delhi.
5. James C. Snyder, Introduction to Architecture, New York: McGraw Hill.
6. Christopher Alexander, Pattern Language, New York: Oxford University Press
7. Thomas Mitchell, Redefining Designing: From to Experience,
8. James Snyder and Anthony Y catanse, Introduction to Architecture, Mc Graw-Hill Book Company, New York, 1979.
9. Rapoport, Amos, House form & Culture

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1P1	WORKSHOP – CARPENTRY AND MODEL MAKING	0	0	4	4	50	0	50

COs	Course Outcomes	POs	BTLs
CO1	To understand the need for Model making in design	1,2,3,5, 9,10	2
CO2	To understand various tools and machines involved in Model making	1,2,3,5, 9,10	2
CO3	To study and understand the materials available in the market for model making	1,2,3,5, 9,10	3
CO4	To understand the techniques of scale modelling	1,2,3,5, 9,10	6
CO5	To understand the techniques for the preparation of presentation models	1,2,3,5, 9,10	6
CO6	To study the types of joinery used in Carpentry	1,2,3,5, 9,10	3,6

At least three major assignments involving the individual students to fabricate. Scale model of a piece of furniture, Presentation of models, Mock-up of everyday objects. Three-dimensional forms etc.
Documentation of the important phases of fabrication is a must which shall become the basis for internal evaluation.

MODULE – I

INTRODUCTION TO MODEL MAKING: Need; the role of scale models in design; general practices; Digital models.

MODULE – II

ESSENTIALS OF MODEL-MAKING: understanding of various tools and machines employed, and best practices involved in operating the tools and the techniques.

MODULE – III

Survey of various materials available for model making such as papers, mount boards, wood, plastics, films, plaster of Paris, acrylic, Styrofoam, wax, metals, glass, FRP, etc., and exploring their potential in model-making.

MODULE – IV

TECHNIQUES OF SCALE-MODELLING: Use of different scales; templates; measuring aids; conventions followed.

MODULE – V

Techniques for preparation of presentation models, mock-ups, and simulation of various materials and textures such as wood, glass, aluminium, steel, bricks, roofing tiles, flooring, corrugated sheets, upholsteries, etc.

MODULE – VI

CARPENTRY: Different types of joints are used in carpentry. Joinery details are commonly used in timber construction. Application of surface finishes such as polish, varnish, and lacquer on wood.

REFERENCE BOOKS

1. Bernald, S and Copplene, Myers. History of Art.
2. Craven, C. Roy. Indian Art a Concise History.
3. Krier, Rob. Elements of Architecture. Academy Editions, London, 1992.
4. Lang, Jon. A Concise History of Modern Architecture in India. Permanent Black, Delhi, 2002.
5. Magnet, Jacque. The Aesthetic Experiences: An anthropologist looks at Visual Art.
6. Preble, Duame. Art Forms.
7. Snyder, C. James, and Catanese, J. Anthony. Introduction to Architecture.
8. Tapert, Annette. Swid Powell: Objects by Architects. Rizzoli, New York, 1990.
9. Thyagarajan. Basic practical photography
10. Ching Francis D.K: Architecture: Form, Space, and Order

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
I	AR21B1G1	ENVIRONMENTAL STUDIES	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the importance of the environment and natural resources	6,7,8	1, 2
CO2	To acquire knowledge on various principles of eco-systems and their functions.	6,7,8	1, 2
CO3	To gain knowledge of various principles, threats, and conservation of biodiversity.	6,7,8	1, 2
CO4	To understand the importance of national and international concern for the protection of the environment from various pollutants	6,7,8	1, 2
CO5	To understand various social issues related to the environment	6,7,8	1, 2
CO6	To understand the impact of the human population on the environment.	6,7,8	1, 2

MODULE – I

ENVIRONMENTAL STUDIES INTRODUCTION: Definition, scope and importance, Measuring and defining environmental development indicators.

Environmental and Natural Resources: Renewable and non-renewable resources - Natural resources and associated problems - Forest resources - Use and over-exploitation, deforestation, case studies - Timber extraction, dams- benefits and problems.

MODULE – II

BASIC PRINCIPLES OF ECOSYSTEMS FUNCTIONING: Concept of an ecosystem. -Structure and function of an ecosystem. - Producers, consumers, and decomposers. - Energy flow in the ecosystem Ecological succession. - Food chains, food webs and ecological pyramids.

Introduction, types, characteristic features, structure, and function of the following ecosystem:

1. Forest Ecosystem
2. Grassland Ecosystem
3. Desert Ecosystem
4. Aquatic Ecosystem (Ponds, Streams, Lakes, Rivers, Oceans, Estuaries)

MODULE – III

BIODIVERSITY AND ITS CONSERVATION: Introduction – Definition- genetic, species and ecosystem diversity. Bio-geographical classification of India

Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India.

Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

MODULE – IV

ENVIRONMENTAL POLLUTION:

Definition, Cause, effects, and control measures of

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards

MODULE – V

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development -Urban problems related to energy -Water conservation, rainwater harvesting, and watershed management - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and the holocaust. Case Studies. – Wasteland reclamation

MODULE – VI

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nations. Population explosion Role of information technology in Environment and human health. - Case Studies. Fieldwork: Visit a local area to document environmental assets such as River /forest grassland/hill/mountain -Visit a local polluted site-Urban/Rural/Industrial/ Agricultural study of common plants, insects, and birds. - Study of simple ecosystems- ponds, rivers, hill slopes, etc.

TEXTBOOKS

1. Erach Bharucha, A Text Book of Environmental Studies for Undergraduate Courses, University Grants Commission.
2. Perspectives in Environmental Studies, Anubha Kaushik and C P Kaushik, New Age International Publishers, New Delhi, 2018.
3. A Textbook of Environmental Studies, Shashi Chawla, McGraw Hill Education, New Delhi, 2017.

REFERENCE BOOKS

1. Environmental Studies by Benny Joseph, McGraw Hill Education, New Delhi, 2017.
2. Fundamentals of environmental studies, Mahua Basu and S Xavier, Cambridge University Press, New Delhi, 2017.

SECOND SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2S1	ARCHITECTURAL DESIGN – I	1	8	0	9	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand and study the importance of anthropometry	1,2,3,4,5, 9,10,12	2
CO2	To study the functional spaces and optimum areas required for a design	1,2,3,4,5, 9,10,12	2
CO3	To study and understand human considerations like privacy, convenience, comfort, etc	1,2,3,4,5, 9,10,12	3
CO4	To study the site and the context	1,2,3,4,5, 9,10,12	4,6
CO5	To understand the development of concepts	1,2,3,4,5, 9,10,12	4,6
CO6	To study the site and its context	1,2,3,4,5, 9,10,12	4,6

COURSE CONTENT

ANTHROPOMETRICS: Basic -average measurements of the human body in different postures-its proportion and graphic representation, application in the design of simple household and street furniture. Use of mannequins in defining spatial parameters of design.

Listing important local buildings and understanding the reasons for their importance.

Listing and Drawing silhouettes of favourite buildings or places.

Observing the built environment around and experiencing enclosures (field trips)

Local stories on architecture.

DESIGN TASKS

Design of a simple building in the immediate or observable environment. Exercises relating personal experiences to behavioural needs and translating them into architectural program requirements. A systematic introduction to issues related to the design of human habitat, its components and space standards. The Elements of site-planning and landscaping. Interpretation of site information as a decision-making aid. The design of the environment outside the building. Problems aimed at drafting and presentation skills in the 2-D format.

Areas of focus/ concern:

Design activity will be limited to the level of visual composition, architectural form and space, aesthetic and psychological experience of form and space in terms of scale, colour, light, texture,

etc., function and need user requirements, anthropometrics, space standards, circulation image and symbolism.

Suggestive Typologies/ projects:
Small living space, i.e. bedroom, bathroom, kitchen; shop, exhibition pavilion, children's environment, snack bar, petrol bunk, fire station, residence etc,

REFERENCE BOOKS

1. Chiara Joseph de and Others. Time Savers Standards of Building Types. McGraw – Hill, 1980.
2. Kirk, Paul Hayden, and Sternberg, D. Eugene. Doctors Offices and Clinics, 2nd ed. Reinhold Pub., USA, 1960.
3. Ching Francis. D.K. - Architecture - Form Space and Order, Phaidon Press, 2012
4. Neufert, Ernst. Ernst Neufert Architects Data, Granada Pub. Ltd., London, 1970.
5. Pevsner, Nikolaus. A History of Building Types. Thames and Hudson, London, 1976.
6. Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub. Co., New Delhi, 1996

Mode of evaluation: Continuous Assignments, Final Assessment Test

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2S2	ARCHITECTURAL DRAWING AND GRAPHICS – II	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the arch forms, and exercises on design concepts	1,2,3,4,5, 9,10,12	2,5
CO2	To understand Solid Geometry: Simple Projections, Isometric views	1,2,3,4,5, 9,10,12	2,5
CO3	To study the Sciography and implement shadow techniques in practical examples	1,2,3,4,5, 9,10,12	2,5
CO4	To understand the Fundamentals of perspectives	1,2,3,4,5, 9,10,12	2,5
CO5	To study the two-point perspective drawings	1,2,3,4,5, 9,10,12	2,5
CO6	To study the rendering techniques.	1,2,3,4,5, 9,10,12	2,5

MODULE – I

GEOMETRIC FORMS: Ovolo Covetta, Ogee, Lancet, Horseshoe, Moorish, Stilted and Rampant, Tudor, three centred and drop. Exercises on Design Concepts i.e Ionic volute, Entasis of the column, Golden Ratio, Archimedian Spiral Fibonacci series etc.

MODULE – II

SOLID GEOMETRY: Simple Projections – Projection of solids – Developments
Isometric & Axonometric Isometric Views of Objects, building components such as Steps, Canopy etc. Diametric and Trimetric Views, Oblique Views etc.

AXONOMETRIC VIEW: Axonometric view of objects, interior view of rooms etc.

MODULE – III

SCIOGRAPHY:
Principles of Shade and Shadows - shadows of lines and Circles - Shadows of Architectural Elements - Shadows of Circular Solids - Shadows of Buildings – reflections

MODULE – IV

FUNDAMENTALS OF PERSPECTIVES - I
Introduction to perspectives, the difference between views & perspectives, and Types of perspectives: one point, two-point & three-point, Anatomy of Perspectives - Objects, the study of the picture plane, station point, vanishing point, Eye level, Ground level etc., its variation & effects.

MODULE – V

FUNDAMENTALS OF PERSPECTIVES - II

Perspective drawing of simple and complex objects, one-point and two-point perspectives of interiors and exteriors, sectional perspectives.

MODULE – VI

RENDERING TECHNIQUES:

Introduction to surfaces and media, observation, recording and basic representation techniques in different media through drawing pencil, pen, brush, charcoal, crayons etc.

Introduction of rules of composition, color study, values, tones and general approach to rendering, Entourage, treatment of sky, clouds, landscape elements, human figures, foreground and surroundings, and shadow projections in renderings.

REFERENCE BOOKS

1. Atkins, B. (1986). Architectural Rendering. California: Walter Foster Art Books.
2. Batley, C. (1973). Indian Architecture. Bombay : D. B. Taraporevale Sons.
3. Bhatt, N. D. (2003). Engineering Drawing. Anand: Charotar Publishing House.
4. Ching, F. D. K. (2009). Architectural Graphics. 5th Ed. Hoboken: John Wiley & Sons.
5. Ching, F. D. K. (2011). A Visual Dictionary of Architecture. 2nd Ed. Hoboken: John Wiley & Sons.
6. Dinsmore, G. A. (1968). Analytical Graphics. Canada: D. Van Nostrand, Company Inc.
7. Halse, A. O. (1972). Architectural rendering; the techniques of contemporary presentation. 2Nd Ed. New York: McGraw-Hill.
8. Holmes, J. M. (1954). Applied Perspective. London: Sir Isaac, Piotman and Sons Ltd.
9. Narayana, K. L. and Kannaiah, P. (1988). Engineering Graphics. New Delhi: Tata McGraw-Hill.
10. Norling, E. (1969). Perspective drawing. California: Walter Fostor Art Books.
11. Robert, W. G. (2006). Perspective: From Basic to Creative. 1st Edition

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2S3	Building Materials and Construction - II	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the building materials Timber and Bamboo	1,7,10	2
CO2	To understand the building materials Lime and Cement	1,7,10	2
CO3	To understand the installation of Carpentry and joinery, panelling, soundproofing and lightweight partitions	1,3,5,10	3
CO4	To understand the different types of doors and windows in accordance with the type of usage and draw the construction details of them.	1,3,5,10	3
CO5	To understand and apply rural materials for building construction	1,3,5,10	3
CO6	To understand the building materials such as flooring and their application of it with respect to the construction details.	1,3,5,10	3

MODULE – I

TIMBER: Classification of trees, the structure of trees, Defects in timber, Storage of timber, Uses of timber, characteristics, seasoning of timber, Defects and diseases, Decay of timber, Preservation, Fire resistance, Conservation of timber.

BAMBOO: Anatomy of Bamboo, Properties, strength, processing, harvesting, working of Bamboo tools – Treatment and preservation of Bamboo and uses of Bamboo. Cane, Propagation Roofing materials – Thatch, grass, Bamboo, reeds.

MODULE – II

LIME: Basic definitions, types of binding sources of lime, classification of lime, properties and uses of various types of limes, Lime mortar and surkhi.

CEMENT: Composition, Manufacturing, Properties of cement – Uses of Cement – Tests for cement, Cement mortar, Introduction to RCC.

MODULE – III

CARPENTRY AND JOINERY: Terms defined; mitring, ploughing, grooving, rebating, veneering. Various forms of joints in woodwork, such as lengthening joints, bearing joints, halving, dovetailing, housing, notching, tusk and tenon etc;

PARTITION WALLS: Various types of glazed and wooden partitions and panelling; Soundproof and lightweight partitions; Brick partition, reinforced brick partition, brick nogged partition, lath and plaster partition, pre-cast concrete partition, glass block and glass create partition, common wooden partition, trussed partition.

MODULE – IV

DOORS: Definition of terms, types of doors: wooden, ledged, ledged and braced, panelled, flush door. Hinged, single and double shutters, sliding, folding, revolving, pivoted.
WINDOWS: Casement, top and bottom hung, pivoted and sliding sash, UPVC doors and windows.
HARDWARE: fixtures, locks, hinges, and fastenings for doors and windows.

MODULE – V

BUILDING USING VERNACULAR MATERIALS: Roof: Details of a pitched roof and hipped roof with pan tiles and Mangalore tiles. Details of madras terrace roof for small and medium span. Walls: various types of details for walls with bamboo and casuarinas Roofs in rural materials: Details of a thatched roof with casuarinas/ bamboo / CEB framework. Details of palm and hay roof with casuarinas/bamboo/ CEB.

MODULE – VI

GROUND AND UPPER FLOORS: solid floor, brick flooring, floor finishing and floor coverings, Basement floor. Wooden ground and upper floors: Terms defined, bridging joists, binding joists, binders, beams and girders, solid and herringbone strutting, floorboards, ceiling joists, trimming floors to accommodate a fireplace.

FLOORING & FLOORING FINISHES: Various natural and manufactured materials: Types of Stone flooring: Granite, Marble, Kota, Shahbad (Limestone), Flagstone, Wooden Flooring, Ceramic and Vitrified Tiles. Concrete floors, Brick on edge, Indian patent floor, granolithic, terrazzo, pitch mastic, Magnesium Oxide, Chloride

TEXTBOOKS

1. W.B. Mickay – Building Construction Vol 1 and 3 – Longmans, UK 1981
2. S.C.Rangwals – Engineering materials – Charotar Publishing, Anand.
3. Dr B.C Punmia – Building Construction
4.

REFERENCE BOOKS

1. Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2. Bindra,S P.and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3. Hailey and Hancork, D.W. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
5. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2C1	STRUCTURAL MECHANICS – II	3	0	0	3	50	50	100

Cos	Course Outcomes	POs	BTLs
CO1	To learn about the various types of supports, beams and their applications and evaluate the support reactions.	1,7,8	1, 2
CO2	To understand the Shear force and Bending moment of a Simply supported beam under various loads	1,7,8	1, 2
CO3	To understand the Bending stress distribution of beams for different cross-sections	1,7,8	1, 2
CO4	To understand the Shear stress distribution of beam for different cross-sections	1,7,8	1, 2
CO5	To understand combined stresses, the core of the section for no tension and stress distribution for columns under various conditions.	1,7,8,10	1, 2
CO6	To apply the methods to calculate the deflection of a beam	1,7,8,10	1, 2, 3

MODULE – I

BEAMS

Definition of Beam, types of supports, classification of beams, applications and their reactions, types of loads, calculation of support reactions for simply supported beams (Simple Problems)

MODULE – II

SHEAR FORCE AND BENDING MOMENT

Shear Force, Bending Moment, Sign conversion, Relation between shear force and Bending Moment, shear force and bending moment diagrams for simply supported beams subjected to various types of loading such as Point loads and uniformly distributed loads (No derivations)- Simple Numericals

MODULE – III

BENDING STRESSES IN BEAMS

Introduction-Theory of simple bending – Determination of bending distribution at a cross-section due to bending moment for Rectangular, I and T sections using standard formulae.

MODULE-IV

SHEAR STRESSES IN BEAMS

Introduction–Shear Stress- Determination of shear stress distribution at a cross-section of rectangular, I and T sections using standard formulae.

MODULE-V

COMBINED STRESSES

Introduction, the stress distribution of eccentrically loaded column, middle third rule, core or Kernal of Section, stress distribution for a column with one-axis eccentricity, two-axis eccentricity, Numericals

MODULE – VI

DEFLECTION OF BEAMS

Introduction of slope and deflection -Determination of deflection for simply supported, fixed, continuous and Cantilever beams subjected to loads using standard formulas.

TEXTBOOKS

1. Bansal, R., & Bansal, S. (2015). Engineering Mechanics. New Delhi: Laxmi Publications (P) Ltd.
2. Bjorn N Sandekar et al, The structural basics of Architecture – 2nd edition, Routledge, Newyork, 2011.
3. Mario Salvadori, Robert Heller, Structure in Architecture, Prentice International Series in Architecture, New Jersey, 1963.
4. STRUCTURES - Martin Bechthold, Daniel L Schodek, and PHI Learning Private Limited, Sixth Edition
5. Curt Siegel, Structure and Form in Modern architecture, Reinhold publishing corporation, Newyork, 1962.
6. Rowland J. Mainstone, Developments in Structural form, Architectural Press, Oxford, 1975.
7. Structure and Design, by G. G. Schierle
8. Strength of Materials – R K Bansal, Laxmi Publications, New Delhi, 3rd ed'
9. I B Prasad, Applied Mechanics & Strength of Materials
10. G G Schierle, Architectural Structures, University of Southern California Custom Publishing C/O Chauncey Jemes Los Angeles
11. Angus J. Macdonald, Structure and Architecture, University of Edinburgh, Second edition
12.

REFERENCE BOOKS

1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.
4. Schierle, G. (2008). Structure and Design. University Readers.
5. Schodek, D., & Bechthold, M. (2013). Structures. Pearson; 7th Edition.
6. Singer, F. (1975). Engineering Mechanics. Weather hill: Harper & Row, 3rd Edition
7.

Assessment: *Internal Marks will be evaluated based on Mid-term Examinations and Assignments.*

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2C2	History of Architecture – I	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the Architectural development of the ancient civilizations in the Indus valley, Egypt, etc	1,3,6,7, 9,10	2
CO2	To understand the Architecture in the Classic Greek periods	1,3,6,7, 9,10	2
CO3	To understand the architecture in the Roman period	1,3,6,7, 9,10	2
CO4	To study and understand the Architecture of the early Christian and the rest of the world excluding Asia.	1,3,6,7, 9,10	2
CO5	To understand the revival in architecture, the study of building typologies.	1,3,6,7, 9,10	2
CO6	To study the other architectural styles	1,3,6,7, 9,10	2

MODULE – I

INTRODUCTION TO ANCIENT ARCHITECTURE AND EGYPTIAN ARCHITECTURE

Architectural development in the ancient civilizations in Indus valley, Egypt, and Mesopotamia, the study of Pyramids, Temples, Mastabas, and Ziggurats.

MODULE – II

CLASSICAL GREEK ARCHITECTURE

Architecture in the Classic Greek periods, different orders, optical correction, and appreciation of perfection.

MODULE – III

ROMAN ARCHITECTURE

Architecture in the Roman period; Grand scale, application of Greek orders; Construction of vaults; study of different typologies of buildings; development of roads and aqueducts

MODULE – IV

EARLY CHRISTIAN AND BYZANTINE ARCHITECTURE

Architecture in the early Christian, Byzantine, Romanesque, and Gothic periods in Europe and the rest of the world excluding Asia.

MODULE – V

ARCHITECTURE IN RENAISSANCE AND BAROQUE

Revival in architecture, Rococo Architecture style – Artistoric, organic, the study of building typologies.

MODULE – VI

INDUSTRIAL REVOLUTION IN EUROPE

The other architectural styles preceding the advent of the Industrial Revolution in Europe - Mannerist architecture, Jacobean architecture, Elizabethan architecture, Victorian architecture, and Moorish architecture.

Note: Documentation of any style is mandatory

REFERENCE BOOKS

1. Fletcher, Sir Banister. A History of Architecture, 19th ed. CBS Pub., Delhi, 1992.
2. Yarwood, Doreen. A Chronology of Western Architecture. B.T. Batsford Ltd., London, 1987.
3. Schulz, Christian Norberg. Meaning in Western Architecture, 2nd ed. Rizzoli Intl. Pub
4. Cobblestone, Trewin, and Others. World Architecture: An Illustrated History, 11th ed. Hamlyn, London, 1979.
5. Bindoo. D.D, History of Architecture, Milind P Lakshana, Hyderabad – 2006.
6. Wittkaner R Architectural Principles in the Age of Humanism, Chichester: Academy Editions 1998

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2C3	Surveying and Levelling	2	0	1	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the basic principles of surveying, fundamentals & instruments of surveying	1,5,9	1,3
CO2	To learn the usage and application of linear measurements through chain, tape, and computation of areas by different methods	1,5,9	1,3
CO3	To learn the usage and application of angular measurements through a compass	1,5,9	1,3
CO4	To understand basic principles in levelling, theodolite & contouring	1,5,9	1,3
CO5	To understand the application of modern surveying methods like EDM, total station & GPS surveying	1,5,9	1,3
CO6	To understand and carry out aerial surveying	1,5,9	1,3

MODULE – I

INTRODUCTION: Definitions – Basic Principles of Surveying; Classification of Survey; Uses of Survey - Scales and Symbols-Sources of errors in Survey – Linear Measurement: accurate and approximate methods, duties of Surveyor. Difference between a plan and a map.

MODULE – II

CHAIN SURVEYING: principles of chain surveying, well-conditioned triangle, types of chains and tapes. Instruments for chaining and taping – ranging-cross staffs – offsets – obstacles in chain surveying – errors and corrections (standardization, temperature and pull)
composition of Areas: Trapezoidal rule – Average ordinate-Simpson rule

MODULE – III

COMPASS SURVEYING: Introduction – Prismatic Compass and Surveyors Compass – Types of Bearings-Designation of bearings – Fore bearing and back bearing – Types of Traverses – Temporary adjustments of the prismatic compass, local attraction, Corrections, precautions, errors.

MODULE – IV

LEVELING – Introduction –Definitions of terms used in levelling – Principle of levelling – Classifications- temporary adjustments of dumpy level, RL's by the height of instrument and rise and fall method, – errors in levelling

THEODOLITE: Essential parts of theodolite, the function of a clamp and tangent screws, adjustments temporary,

CONTOURING: Introduction to contouring – characteristics and uses

MODULE – V

MODERN FIELD SURVEY: Principle of Electronic Distance Measurement, Total Station – Parts of a Total Station – Accessories –Advantages, disadvantages and Applications, Global Positioning Systems-Segments, Advantages & disadvantages, Applications of GPS.

MODULE – VI

PHOTOGRAMMETRY SURVEYING: Aerial photographs - vertical and oblique photographs - height determination contouring - photographic interpretations - stereoscopy – parallax Flight Planning- Photo Interpretation, Applications of aerial Photos.

TEXTBOOKS

1. Dr. K.R. Arora, Surveying Vol-1 & Vol-2, Thirteenth Edition, Standard Book House, 2015
2. Dr B.C. Punmia, Er. Ashok K. Jain and Dr Arun K. Jain., Surveying Vol-1 & Vol-2, Sixteenth Edition, Laxmi Publications (P) Ltd., 2005.
3.

REFERENCE BOOKS

1. R. Subramanian, Surveying and levelling, Second Edition, Oxford University Press, 2012.
2. S. K. Duggal., Surveying Vol-1, Fourth edition, McGraw Hill., 2013.
3. S. S. Bhavikatti, Surveying and Levelling Vol-1, I. K. International Publishing House Pvt. Ltd., 2008.
4. Surveying and Levelling by N. N. Basak

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2C4	Theory of Architecture and Design	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the fundamentals of design.	1,3,5,9, 10,12	2
CO2	To understand the design process.	1,3,5,9, 10,12	2
CO3	To understand the design problems and solutions.	1,3,5,9, 10,12	2
CO4	To understand the importance of design thinking and its process towards design.	1,3,5,9, 10,12	2
CO5	To understand the different design concepts and strategies.	1,3,5,9, 10,12	2
CO6	To understand the design process with respect to the building.	1,3,5,9, 10,12	2

MODULE – I

DESIGN

Definition of design, understanding of design, the purpose of design, nature of good design and evaluation of design, types of design classifications, the role of designer, and design in history.

MODULE – II

DESIGN PROCESS

The context for architectural design problems, design process, behavioural architecture, stages in the design process, different considerations, and different ideas of design methodology.

MODULE – III

DESIGN PROBLEMS AND SOLUTIONS

Different approaches to design, problem-solving or intuitive, formulation of problems, nature of creative design problems, and goals in design.

MODULE – IV

DESIGN THINKING

Understanding the terms - creativity, imagination, etc. Theories on thinking, convergent and divergent thinking, lateral and vertical thinking, creative techniques like checklists, brainstorming, syntactic, etc. design puzzles and traps, blocks in creative thinking, and sociometry.

MODULE – V

DESIGN CONCEPTS, PHILOSOPHIES AND STRATEGIES

Various approaches to generate ideas for architectural design - types of concepts, personal philosophies and strategies of individual designers, channels that foster creativity in architecture

MODULE – VI

DESIGN PROCESS AND ANALYSIS OF BUILDING

Design process –integration of aesthetics and function - Understanding of formative ideas, organization concepts, spatial characteristics, - Massing and circulation in the design analysis of the following buildings: Falling water house, & Guggenheim Museum by F. L. Wright -Villa Savoye & Chapel of Notredame DuHaut by Le Corbusier.

TEXTBOOKS

1. Geoffrey Broadbent - Design in Architecture - Architecture and the human sciences - John Wiley & Sons, New York, 1981
2. Nigel Cross - Developments in Design Methodology, John Wiley & Sons, 1984
3.

REFERENCE BOOKS

1. Bryan Lauson - How Designers Think, Architectural Press Ltd., London, 1980.
2. Tom Heath - Method in Architecture, John Wiley & Sons, New York, 1984

Semester	Course Code	Course Title	L	T	P	C	Int. Marks	Ext. Marks	Total Marks
II	AR21B2G1	Communication Skills	1	0	1	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To know the importance of communication and its types	9,10,12	1,2
CO2	To listen & read effectively using vocabulary.	9,10,12	1,2
CO3	To learn writing skills effectively, when necessary, at the workplace for effective communication.	9,10,12	1,2
CO4	To Develop interview & presentation skills	9,10,12	1,2
CO5	To Develop Leadership qualities and essentials.	9,10,12	1,2
CO6	To give effective presentations in various seminars/ workshops/ conferences & can carry out day-to-day communication at the workplace by using technology to facilitate efficient interpersonal communication	9,10,12	1,2

MODULE – I

FUNDAMENTALS OF COMMUNICATION: Definition of communication, Importance of communication, Elements of communication, 7Cs of Effective Communication, Barriers to effective communication, Measures to Overcome the Barriers to Communication, Different types of communications with their significance and its advantages

MODULE – II

LISTENING SKILLS: Hearing Vs listening, the importance of listening and its types, Barriers to effective Listening, Qualities of a Good Listener and Active vs Passive Listening

READING SKILLS: Skimming and Scanning, Intensive and Extensive Reading, Poor habits of reading and The SQ3R Method.

MODULE – III

CREATIVE WRITING: Scope of creative writing; Report Writing, Paragraph, Letter Writing (formal and Informal), Memo, Circular, Preparation of Agenda, Minutes of the meeting, Notice, Description of projects and features

MODULE – IV

INTERVIEW SKILLS: Purpose of an interview, Do‘s and Don’ts of an interview

GIVING PRESENTATIONS: Dealing with Fears, planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery

MODULE – V

GROUP DISCUSSION: Introduction, Communication skills in group discussion, Do's and Don'ts of group discussion.

MODULE – VI

COMMUNICATION THROUGH ELECTRONIC CHANNELS: Technology based Communication Tools, Video Conferencing, Web Conferencing, Selection of the Effective Tool, E-mails, Fax, Telephonic Skills etc

TEXTBOOKS

1. Muralikrishna C., Sunita Mishra "Communication Skills for Engineers" 2nd edition, Pearson, New Delhi 2010.
2. Krishna Mohan &Meera Banerji: Developing Communication Skills Macmillan India.
3. Raman, M & Sharma, S., Technical Communication: Principles and Practice. Oxford University Press, New Delhi 2014.

REFERENCE BOOKS

1. Swan, Michael, Practical English Usage, (4e) Oxford University Press, London 2017.
2. Vyas Manish A., Yogesh L. Patel, "Tasks for the English Classroom", MacMillan, New Delhi, 2012.
3. Communication Skills, by Sen, Leena: Prentice Hall of India, New Delhi
4. Communication Skills, by Prasad, P: S.K. Kataria& Sons
5. Course in Listening and Speaking Skills Part I by GeethaRajivan, Kiranmai: Foundation Books Pvt Ltd.
6. Enrich your Communication in English by Sujatha Mukiri: Lorven Publication Hyd

Semester	Course Code	Course Title	L	T	P	C	Int. Marks	Ext. Marks	Total Marks
II	MC21B202	VALUE EDUCATION	1	0	0	-	-	-	-

COs	Course Outcomes	POs	BTLs
CO1	The 3-week Student Induction Program (SIP) is to prepare newly admitted undergraduate students for the new stage in their life by facilitating a smooth transition from their home and school environment into the college and university environment through various discussions and activities.	NA	NA
CO2	Become familiar with the ethics and culture of the institution (based on institutional culture and practices)	NA	NA
CO3	Set a healthy daily routine, create bonding in batches as well as between faculty members and students	NA	NA
CO4	Get exposure to a holistic vision of life, develop awareness, sensitivity and understanding of the Self-family-Society-Nation-International---Entire Nature	NA	NA
CO5	Facilitate them in creating new bonds with peers and seniors who accompany them through their college life and beyond	NA	NA
CO6	Overcome weaknesses in some essential professional skills – only for those who need it (e.g. Mathematics, Language proficiency modules)	NA	NA

MODULE – I

Value Education—Introduction – Definition of values – Why values? – Need for Inculcationof values – Object of Value Education – Sources of Values – Types of Values: i) Personal values ii) Social values iii) Professional values iv) Moral and spiritual values Behavioral (common) values

MODULE – II

Personal –definition of person-self-confidence- relative and absolute confidence, being self-determined, swatantra (loosely equivalent to freedom)

Self- discipline- self-assessment- self-restraint-self motivation- determination-ambition- contentment, self-respect and respect to others, expression of respect

MODULE – III

Social values – Units of Society - Individuals, family, different groups – Community– Social consciousness – Equality and Brotherhood – Dialogue – Tolerance –Sharing – Honesty-Responsibility – Cooperation; Freedom – Repentance and Magnanimity.

Peer Pressure – Ragging - examples - making one's own choices

MODULE – IV

Professional values-Definition-Competence-Confidence-Devotion to duty- Efficiency-Accountability.– Respect for learning /learning – Willingness to learn-Open and balanced mind – Team spirit– Professional

Ethics – Willingness for Discussion; Difference between understanding andassuming.
Time Management: Issues of planning, as well as concentration (and aligning with self-goals) Expectations from yourself. Excellence and competition, coping with stress, Identifying one's interests as well as strengths

MODULE – V

Behavioural values – Individual values and group values. Anger: Investigation of reasons, watching one's anger; Understanding anger as a sign of power or helplessness, distinction between response and reaction.

Right utilization of physical facilities. Determining one's needs, needs of self and thebody, cycle of nature.
Relationship with teachers. Inside the class, and outside the class, interacting withteachers.

MODULE – VI

Complimentary nature of skills and values. The distinction between information & knowledge
Goals: Short-term goals and long-term goals; How to set goals; How to handleresponsibilities which have to be fulfilled while working for goals

REFERENCE BOOKS

1. Ramancharla Pradeep Kumar. Compiled Reading Material IIIT Hyderabad
2. Dr S. Ignacimuthu S. J., Values for life, Better yourself Books, Bandra Mumbai- 600050 (1999).
3. Values (Collection of Essays)., Published by: Sri Ramakrishna Math., Chennai—(1996)
4. Prof. R.P.Dhokalia., Eternal Human ValuesNCRT –Campus Sri Aurobindo Marg.,New Delhi
5. Swami Vivekananda.,Education., Sri Ramakrishna Math., Chennai-4(1957)

THIRD SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3S1	Architectural Design – II	1	8	0	9	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	This course is intended to provide skills for designing single-use, small-span, and single-story buildings	1,2,3,4,5, 9,10,12	2,3,6
CO2	To develop abilities in design in the context of user requirements. Expected Skills / Knowledge Transferred.	1,2,3,4,5, 9,10,12	2,3,6
CO3	To develop the use of standards, handling of space,	1,2,3,4,5, 9,10,12	2,3,6
CO4	To understand the application of knowledge gained from other subjects in design	1,2,3,4,5, 9,10,12	2,3,6
CO5	To understand the relevant design considerations for barrier-free design and the differently abled	1,2,3,4,5, 9,10,12	2,3,6
CO6	To understand the volumetric designs and space articulation through different materials.	1,2,3,4,5, 9,10,12	2,3,6

COURSE CONTENT

The design issues to be addressed:

- Various functions and their spatial implications.
- Formulations of concept.
- Anthropometry and furniture layout
- Horizontal circulation
- Interior volumes and space articulation through different materials.
- Integration of form and function.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.

At least one major exercise and one minor design/time problem should be given.The final submission shall necessarily include a model for the major exercise

DESIGN TASKS

Design of a simple building for public activity in a non-urban setting, or a situation without urban regulatory controls. Introduction to other role players in the Architectural process viz., the client and the user. Appreciation of the nonpersonal view as a process resource.

Study of the social and physical environment & methods of construction in vernacular architecture,

emerging out of the traditional way of life of the people in a given place, including topographic survey and subjects studied in the previous

semester to be integrated to enhance students' knowledge with an applied session. This may be a village or part of a small town.

Areas of concern/ focus:

- form-space relationships
- spatial organization
- behavioral aspects especially those relating to children
- site planning aspects
- appropriate materials and construction

Suggestive Typologies/ projects:

Residential buildings, institutional buildings: nursery or primary schools, schools for children with specific disabilities, primary health centre, banks, neighbourhood market, neighbourhood library, gate complexes including security Kiosk and entry/exit gates, restaurant, museum/health club and small resort etc,

REFERENCE BOOKS

1. Chiara Joseph de and Others. Time Savers Standards of Building Types. McGraw– Hill, 1980.
2. Kirk, Paul Hayden, and Sternberg, D. Eugene. Doctors Offices and Clinics, 2nd ed. Reinhold Pub., USA, 1960.
3. Neufert, Ernst. Ernst Neufert Architects Data, Granada Pub. Ltd., London, 1970.
4. Pevsner, Nikolaus. A History of Building Types. Thames and Hudson, London 1976.
5. Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub. Co., New Delhi, 1996.
6. A History of Building Types-Nikolays Pevsner.
7. National Building code

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3S2	Building Materials and Construction - III	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the building materials metals	1,7,10	2
CO2	To understand the building materials Polymers	1,7,10	2
CO3	To understand the details of the staircase.	1,3,5,10	3
CO4	To understand the RCC in the structural part of the building.	1,3,5,10	2
CO5	To understand RCC and its application in various phases of the built structure.	1,3,5,10	3
CO6	To understand various steel works applications to build a structure.	1,3,5,10	3

MODULE – I

METALS: Ferrous metals - Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: structural steel, stainless steel, steel alloys –properties and uses.
NON-FERROUS METALS: Properties and uses of aluminium, zinc, lead, copper. Aluminium windows and doors, aluminium and its uses in interiors, aluminium frames, partitions, glazing & panels.

MODULE – II

POLYMERS: UPVC, PVC, RUBBER ETC., Manufacturing process, Properties & types, Thermoplastics and thermosetting plastics –Structural plastics –Reinforced plastics and Decorative laminates- Plastic coatings–Fabrications of plastics. Primary plastic building products for walls, roofs and partitions. Secondary building products for rooms, windows, roof lights, domes, gutters and handrails.

MODULE – III

STAIRCASES: Principles of staircase construction and its elements; Terms defined, Tread, riser, stringer, nosing, flight, landing, headroom, handrail, balusters, newel post. types of stairs i.e., straight, doglegged, open well, geometrical, circular, spiral, bifurcated, wooden stairs, stone stairs, metal stairs and elementary knowledge of R.C.C. stairs.

Details of various staircases in wood, stone, steel and RCC.

MODULE – IV

INTRODUCTION TO RCC: Understanding the properties and characteristics of RCC. Its advantages and disadvantages. Cast-in-situ and pre-cast constructional methods in RCC.
Understanding the structural components of a typical RCC frame structure with reference to their location, and junctions.

MODULE – V

SUBSTRUCTURE: RCC foundations – isolated footing (rectangular and trapezoidal footings), pile foundation, combined footing, raft foundation.

SUPERSTRUCTURE: RCC columns – different shapes, different combinations and loading conditions (axial, bending, non-axial), slenderness factor. RCC beams - Single and doubly reinforced beams, T and L beams, continuous beams, lintels, and brackets. RCC slabs – One-way and two-way slabs.

MISCELLANEOUS: RCC staircases and ramp – Waist slab and folded plate staircases. RCC Balconies, chajjas, lintels, arches etc.
Advanced concepts: Flat slab, coffered slab, diaphragms, retaining walls and water tanks, pre-stressed.

MODULE – VI

STRUCTURAL STEEL WORK: General principles and terms defined, standard sections i.e. beams joints, angles, channels, tees, bolts, rivets and welding.

STEEL WORK CONNECTIONS: Bolt Connections, Riveting and welding methods.

STEEL MEMBERS: Columns and stanchions, stanchions or column bases, beam and girders, column and beam connections plate girders, lattice, or warren girder.

TEXTBOOKS

1. W.B. Mickay – Building Construction Vol 1 and 3 – Longmans, UK 1981
2. S.C.Rangwals – Engineering materials – Charotar Publishing, Anand.
3. Dr B.C Punmia – Building Construction

REFERENCE BOOKS

1. Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2. Bindra,S P.and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3. Hailey and Hancork, D.W. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
5. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C1	STRUCTURAL MECHANICS – III	3	0	0	3	50	50	100

Cos	Course Outcomes	POs	BTLs
CO1	To understand the analysis of columns under various end conditions and know how real-life structures behave	1,7,8	1,2, 4
CO2	To impart knowledge about the analysis of indeterminate structures.	1,7,8	1,2, 4
CO3	To understand the Analysis of continuous beams using the moment Distribution Method	1,7,8	1,2,4
CO4	To impart knowledge in the analysis of beams and frames using Kani's Method	1,7,8	1,2,4
CO5	To equip students with concepts of Arches.	1,7,8,10	1,2
CO6	To understand the concept of propped cantilevers.	1,7,8,10	1, 2

MODULE – I

COLUMNS AND STRUTS

Introduction-Difference between Columns and struts, Column orientation, Types of columns, types of failures, Buckling; effective length, critical load, slenderness ratio; Euler formula; "Kern" and rule of inner third columns Buckling and crushing failures, types of end conditions-No derivations (Simple Numericals Using standard formulae).

MODULE – II

STATICALLY INDETERMINATE BEAMS

Introduction – Static Determinacy and Indeterminacy - Determination of degree of statically indeterminacy for beams and frames – Simple Numericals.

MODULE – III

MOMENT DISTRIBUTION METHOD

Introduction, carryover, relative stiffness, application of Moment Distribution Method to Continuous beams, single bay frame without sway (excluding sinking of supports)-Simple Numericals.

MODULE-IV

KANI'S METHOD

Introduction, rotational factors, application of Kani's method for beams and frames (single bay without sinking of supports).- Simple Numericals.

MODULE – V

ARCHES

Determination of horizontal thrust, bending moment and radial shear for three-hinged parabolic and segmental arches with supports at the same level and different levels- Simple Numericals (No derivations)

MODULE – VI

PROPPED CANTILEVERS: Introduction, Reaction of a prop, Cantilevers with Udl's, point loads, prop at the end & intermediate positions- Simple Numericals (No derivations)

TEXTBOOKS

1. Bansal, R., & Bansal, S. (2015). Engineering Mechanics. New Delhi: Laxmi Publications (P) Ltd.
2. S. S. Bhavikatti, Structural Analysis – Vol.I & II, Vikas Publications C. S. Reddy, Basic Structural Analysis, Tata Mc.Graw-Hill, New Delhi.
3. R. C. Hibbeler, Structural Analysis, Pearson, New Delhi
4. T. S. Thandavamoorthy, Analysis of Structures, Oxford University Press, NewDelhi
5. V. N. Vazirani, M. M. Ratwani and S. K. Duggal, Analysis of Structures- Vol. I and II, Khanna Publishers, NewDelhi
6. S. Ramamrutham, & R. Narayanan, Strength of Materials, Dhampat rai Publishing Company.
7. S. Ramamrutham & R. Narayanan, Theory of Structures, Dhampat rai Publishing Company.

REFERENCE BOOKS

1. Devdas Menon, Structural Analysis, Narosa Publishers.
2. Kassimali, Structural Analysis, Cengage Learning
3. R. Vaidyanathan and P. Perumal, Structural Analysis Vol I & II, Laxmi Publications
4. K. U. Muthu, H. Narendra, Maganti Janardhana and M. Vijayanand, Basic Structural Analysis, I k International
5. Theory of Structures, B. C Punmia, A. K Jain & Arun K. Jain, LakshmiPublications

Assessment: *Internal Marks will be evaluated based on Mid-term Examinations and Assignments.*

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C2	History of Architecture – II	3	0	0	3	50	50	100

Cos	Course Outcomes	POs	BTLs
CO1	To attain comprehensive knowledge about Asian and South East Architecture	1,3,6,7, 10	1,2
CO2	To attain comprehensive knowledge about the development of Buddhist architecture.	1,3,6,7, 10	2
CO3	To gain knowledge on the evolution of Hindu temples during the Gupta and Chalukyan period	1,3,6,7, 10	2
CO4	To attain a comprehensive knowledge about the rock cut and stone architecture of the Dravidian period and trace later developments in South India.	1,3,6,7, 10	2
CO5	To appreciate different plan forms of the Indo-Aryan temple with the aid of sketches.	1,3,6,7, 10	2
CO6	To attain a comprehensive knowledge of Islamic Architecture in India	1,3,6,7, 10	2

MODULE – I

ASIAN AND SOUTHEAST ARCHITECTURE

Asian and South East Architecture - Evolution and Architectural features, different styles

MODULE – II

BUDDHIST ARCHITECTURE

Development of Vedic Architecture, Development of architecture in India and rest of Asia in Buddhist Architecture -Evolution of Buddhist architecture. Salient features of a Chaitya Hall and Vihara, and Declination of Buddhism.

MODULE – III

EVOLUTION OF THE HINDU TEMPLE

Evolution of Hindu temple – Different styles of Temple Architecture. Development of Central Indian temple architecture. Early shrines of the Gupta and chalukyan periods –Ladh-Khan and Durga temple, Aihole, Papanatha and Virupaksha temples, Pattadakal.

MODULE – IV

DRAVIDIAN STYLE TEMPLES

Describe the Salient features of Dravidian Temple architecture and Dravidian culture

Rock cut productions under Pallavas –Shore temple, Mahabalipuram, Dravidian Order – Brihadeeswara Temple, Thanjavur - Evolution and form of Gopuram - Complexity in temple plan due to complexity in Ritual, Meenakshi temple, Madurai.

MODULE – V

INDO-ARYAN STYLE OF TEMPLES

Salient features of Nagara temple architecture and different schools involved in the development of Nagara Style.

Describe the temple examples – Mukteshwar Temple Bhubneshwar, Lingaraja Temple Bhubneshwar, Sun Temple Konark, Sun Temple- Modhera, Somanath Temple, Kandariya Mahadeva temple, Vishwanath temple at Khajuraho.

MODULE – VI

ISLAMIC ARCHITECTURE

Islamic Architecture in India: Early Saracenic School in India: Imperial school at Delhi Provincial styles at Gujarat, Deccan, Bengal

Moghul Architecture in India-Humayuns Tomb at Delhi, Fatehpur Sikhri (layout, Buland Darwaza, Diwani Khas, Tomb of Salim Chisti) Akbars Tomb at Sikandara - The Taj Mahal, at Agra - Red Fort at Delhi

Note: Documentation and site study of any style/temple is mandatory

TEXTBOOKS

1. Satish Grover, "Buddhist and Hindu architecture in India", CBS, New Delhi, 2008
2. The History of Architecture in India from the Dawn of civilization to the End of the Raj, Phaidon,
3. London, 2002
4. Percy Brown, "Indian Architecture (Buddhist and Hindu Period)"- TaraporeVala and Sons
5. Bombay, 2014.

REFERENCE BOOKS

1. Yatin Pandya, "Concepts of Space in Traditional Indian Arch", Mapin, 2005.
2. Mitchell, George "The Hindu Temple, University of Chicago Press, 1996
3. Spiro Kostof, "A History of Architecture: Setting and Rituals", Oxford University Press, London, 2005 (digitized – 2007).
4. Christopher Tadgell, The History of Architecture in India, Penguin Books (India) Ltd, New Delhi,1990
5. Brown, Percy. Indian Architecture: Buddhist and Hindu Periods. D.B. Taraporevala Sons and Co., Mumbai, 2003.
6. Grover, Satish. The Architecture of India. Vikas Pub. House Pvt. Ltd., Ghaziabad, 1980.
7. Rowl, Benjamin. Art and Architecture of India.
8. Tadgell, Christopher. The History of Architecture in India: from the Dawn of Civilization to the End of the Raj. Om Book Service, New Delhi, 1990.
9. Vistara. The Architecture of India

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C3	Building Services – I	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To Study Water supply, treatments, distribution, and plumbing systems for all types of buildings.	1,3,5,6, 7,9	2
CO2	To Study Wastewater treatments, Sewer lines for all types of buildings.	1,3,5,6, 7,9	2
CO3	To Study Drainage systems for a Small Campus and a Residential neighbourhood.	1,3,5,6, 7,9	2
CO4	To understand the use and installation of various plumbing fixtures and to know the sewerage systems for sanitary conveyance	1,3,5,6, 7,9	2
CO5	To understand the details of Applications of all the above systems to Buildings, Small campuses and Residential neighbourhoods.	1,3,5,6, 7,9	3
CO6	To understand Refuse collections, disposal, composting, Landfill, and Biogas for a Town and City.	1,3,5,6, 7,9	2

MODULE – I

WATER QUALITY, TREATMENTS AND DISTRIBUTION - Sources of water supply – Water Quality - Water requirements for all types of residential, commercial, and Industrial buildings and town – Water treatment methods – Screening, aeration, Sedimentation, Filtration, Disinfection, Softening, conveyance of water – Distribution of water – Choice of pipe materials - Types of fixtures and fittings – System of plumbing in all type of buildings.

MODULE – II

WASTEWATER, TREATMENT AND DISPOSAL - Wastewater – Sewage disposal, primary treatment. Secondary treatment, biological treatment, and Modern types of Sewage Treatment Plants (design calculations)- Sewer line fixtures and traps, Manholes, design and storage calculation for a Septic tank.

Basic principles of stormwater drainage – drainpipes and type of pipe – stormwater gutter – rainwater harvesting principles – storage sumps.

MODULE – III

BUILDING SANITATION: Principles of sanitation, collection and disposal of various kinds of refuse from buildings. Methods of carrying refuse, systems of refuse disposal, and their principles.

Plumbing definitions and related terms, plumbing systems (one pipe, two pipes etc), House drainage system, Drainage of sub-soil water. Inspection chambers, Manholes, Sub-drains, culverts, ditches, gutters, drop inlets and catch basins, roads and pavements, storm overflow/regulators.

MODULE – IV

PLUMBING AND SANITARY APPLIANCES: Basic principles of Plumbing, need, scope, and terminology. Specifications and installation of sanitary fittings like wash basins, water closets, urinals, bidets, sinks, etc in buildings. Uses of gate valve, float valve, flap valve, ball valve, flush valve, etc, different types of taps, faucets, stop cocks, bib cocks, 'P', 'Q', 'S', floor/bottle traps used in buildings.

Design considerations on drainage scheme. Planning of bathrooms, lavatory blocks and kitchens in domestic and multi-storeyed buildings with relation to neighbourhood. Preparation of plumbing drawings, and symbols commonly used in these drawings.

MODULE – V

SEWERAGE: Indian standards and byelaws for sanitary conveyance. Disposal of sewage from an isolated building, Gradients used in laying of drains and sewers for various sizes. Septic tank details & capacity calculation. Sewage treatment. Use of pumps in sanitation, biogas, soil disposal without water carriage, and rural sanitation.

Layout design and details of water supply distribution system in a Campus or Small residential neighbourhood - Layout design and details of sewage and drainage system for different types of buildings - water supply pipelines, storm water drainage pipelines and Rainwater Harvesting for a small residential neighbourhood.

MODULE – VI

SOLID WASTE DISPOSAL: Properties of Solid Wastes, Physical and chemical composition of municipal solid wastes, waste generation rates. Management of Solid Wastes in India: Prevalent SWM practices and deficiencies

Storage of waste at source, segregation of wastes, primary collection of waste, transportation of waste, disposal of wastes. Disposal of Wastes: Sanitary landfilling, Composting, Incineration, Pyrolysis Solid Waste Disposal: – advantages and limitations.

TEXT BOOKS

1. S.C. Rangwala, "Water supply and sanitary engineering", Chartar publishing house, Anand, 1989. (N.A.)
2. Punmia B.C., "Waste Water Engineering", Laxmi Publications, 2009.
3. Arceivala S.J., "Waste Water Treatment for Pollution Control", Tata McGraw Hill, 2008.
4. 4. Birdie, B. S. (1996). Water supply and Sanitary Engineering. Dhanpat Rai and Sons.

REFERENCE BOOKS

1. Punmia, B. C., Jain, A. K. and Jain, A. K. (1995). Water Supply Engineering. New Delhi: Laxmi Publications.
2. P.N. Modi, Sewage Treatment Disposal and Waste Water Engineering, Standard Book House.
3. National Building Code - 2005.
4. 4. A. Kamala & DL Kanth Rao, Environmental Engineering, Tata McGraw – Hill publishing company Limited

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C4	Site Analysis and Site Planning	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the basics of site planning, history and surveying the site.	1,2,10	2,3
CO2	To understand the importance of site analysis off-site and on-site factors.	2,4,7	2,3
CO3	To understand and analyse the contours, grading with reference to case studies.	2,4,7,10	2,3
CO4	To analyse the site with the existing land conditions, and understand the construction of the structure in landscape circulation roads, parking, paths, level changes	2,4,7,10	2,3
CO5	To understand the site context and analyse the site.	2,4,7,10	2,3
CO6	Case studies on the different typologies of site selection criteria.	2,4,7,10	2,3

MODULE – I

INTRODUCTION

Definition of plot, site, land and region, units of measurements Introduction to Site analysis, history of site design as a source for precedent analysis and Layers of Site Planning. Introduction to the survey, methods of surveying, and where they are used. Need for surveying. Measuring and drawing out a site plan from the measurements

MODULE – II

SITE ANALYSIS

Importance of site analysis; Onsite and off-site factors; Analysis of natural, cultural, and aesthetic factors – topography, hydrology, soils, vegetation, climate, surface drainage, accessibility, size and shape, infrastructures available - sources of water supply and means of the disposal system, visual aspects; Preparation of site analysis diagram. Study of microclimate: - vegetation, landforms, and water as modifiers of microclimate.

MODULE – III

DESIGN OF LANDFORMS IN A SITE

Contours - representation of landforms and landform design, interpolation of contours, slope analysis, uses and function. Grading - Symbols and grading and alignment of paths/roads, angle of repose and use of retaining walls, functional and aesthetic considerations – case studies and exercises.

MODULE – IV

SITE PLANNING PRINCIPLES AND TECHNIQUES

Site Zoning. Organization of vehicular and pedestrian circulation; parking; street widths; turning radii; street intersections; steps and ramps. Site planning considerations in relation to water systems, sewage disposal, and outdoor electrical systems.

MODULE – V

SITE CONTEXT

Context of the site. Introduction to existing master plans land use for cities, development control Rules. Preparation of maps of matrix analysis & composite analysis.

MODULE – VI

CASE STUDIES ON SITE SELECTION

Site selection criteria for housing development, commercial and institutional projects - Case studies and assignments.

REFERENCE BOOKS

1. T S S for Landscape Architecture, Mc Graw Hill, Inc, 1995
2. Kevin Lynch, “Site Planning”, MIT Press, 1967
3. Michael Laurie, “An Introduction to Landscape Architecture”, Elsevier, 1986
4. Motloch, J.L., Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991.
5. Grant W Reid, From Concept to Form in Landscape Design, Van Nostrand Reinhold Company, 1993.
6. Bring, M, "Japanese Gardens: "design & Meaning
7. Simonds, J.O., "Earthscape: A Manual of Environmental planning", McGraw Hill Book Co., New York, 1978.
8. Motloch, J.L., "Introduction to Landscape Design", Van Nostrand Reinhold Publishing Co., New York, 1991., McGraw Hill Book Co., New York, 1981.
9. John Ormsbee Simonds, “Landscape Architecture: A manual of site planning & design”, McGraw Hill,1961.
10. Joseph De Chiarra and Lee Coppleman, “Planning Design Criteria”, Van Nostrand Reinhold Co., NewYork, 1968
11. Thomas H. Russ, “Site Planning and Design Handbook” Pearson Education, 2002

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C5	Climatology	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the built-form interaction with the climate	1,3,5,7,9	2
CO2	To study the Tropical climates.	1,3,5,7,9	2
CO3	To understand the Physiological aspects, comfort zones and Heat flow through Buildings	1,3,5,7,9	2
CO4	To gain knowledge on Solar Geometry Sun path, solar charts, etc	1,3,5,7,9	2
CO5	To understand the flow of air and Natural ventilation to the buildings	1,3,5,7,9	2
CO6	To study the passive techniques	1,3,5,7,9	2

MODULE – I

INTRODUCTION TO BUILDING CLIMATOLOGY:

Climate and built-form interaction. Global Climatic factors, elements of climate

graphic representation of climatic data, Mahoney's Tables, macro, and microclimate; the challenge of rapid, extreme environmental change, Factors that determine climate Components of climate - Characteristics of climate types – Effective temperature

MODULE – II

TROPICAL CLIMATES:

Definition, classification of tropical climates, characteristics of different climatic zones in India, and Design considerations for warm-humid, hot-dry, composite, and upland climates.

MODULE – III

THERMAL COMFORT:

Thermal comfort factors, Physiological aspects, Body heat balance, comfort range, comfort charts, comfort zone.

Heat flow through Buildings: Basic principles of heat transfer through buildings, the performance of different materials, Periodic heat flow

MODULE – IV

SUN AND THE DESIGN PROCESS:

Solar geometry, Solar charts, Sun angles, and shadow angles, orientation for sun, sun control, design of shading devices, building form and heat gain, basic principles of daylighting, sunlight, and glare

MODULE – V

NATURAL VENTILATION:

Air movement around and through buildings, Orientation for wind, stack effect, Induced ventilation. The wind – The effects of topography on wind patterns – Air currents around the building – Air movement through the buildings – The use of fans – Thermally-induced air currents – Stack effect, Venturi effect – Use of courtyard

MODULE – VI

PASSIVE COOLING:

Passive methods of Cooling, roof ponds, desiccant cooling, evaporative Cooling, earth-sheltered buildings, etc. Site Planning (including landscaping) and building planning and design considering climate factors.

REFERENCE BOOKS

1. Handbook for Energy-Efficient Buildings
2. Manual of Tropical Housing and Building – Koenigsberger
3. Theoretical and vernacular related: A place in the shade by Charles correa

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	AR21B3C6	APPLIED ERGONOMICS	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the importance of ergonomics	1,3,6,7, 11	2
CO2	To understand Ergonomics and Design	1,3,6,7, 11	2
CO3	To understand Disability, Ageing and Inclusive Design	1,3,6,7, 11	2
CO4	To know about Environmental Ergonomics	1,3,6,7, 11	2
CO5	To know about the health effects of environmental stressors	1,3,6,7, 11	2
CO6	To do an existing case study of any space/building	1,3,6,7, 11	2

MODULE – I

INTRODUCTION TO HUMAN FUNCTION

The human being in the manmade world and the importance of ergonomics, Gross human anatomy, Ergonomics for children - at the workplace old people

MODULE – II

ERGONOMICS AND DESIGN

Introduction to Anthropometrics – static and dynamic, Muscles and work physiology, Static and Dynamic work including the maximum capacity

MODULE – III

DISABILITY, AGEING, AND INCLUSIVE DESIGN

Built environment for the physically handicapped – Ramp, toilets and corridor design, Spatial Requirements for wheelchair movement-Design issues in the design of old age homes – Criteria to be considered when designing for the blind

MODULE – IV

ENVIRONMENTAL ERGONOMICS

Biomechanics, Environmental Conditions including, thermal, illumination, noise and vibration, Bio transducers and ner5rvous system including their limitations

MODULE – V
HEALTH EFFECTS OF ENVIRONMENTAL STRESSORS Controls and Displays- psycho psychological aspects of Design- Occupational hazards in the work environment –Visual stress – Postural Stress – Stress due to commuting
MODULE – VI
Case Study: Existing space/Building with respect to psychological factors
Note: Documentation of any style is mandatory
REFERENCE BOOKS
1. De Chiara and Callender - Time Savers Standards for Building Types 2. De Chiara and Callender - Time Savers Standards for Architectural data

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
III	MC21B301	Indian Constitution	1	0	0	-	-	-	-

COs	Course Outcomes	POs	BTLs
CO1	To Know the background of the present constitution of India.	6,7	1,2
CO2	To Understand the working of the union, state and local levels.	6,7	1,2
CO3	To Gain consciousness of the fundamental rights and duties.	6,7	1,2
CO4	To understand the functioning and distribution of financial resources between the centre and states.	6,7	1,2
CO5	Be exposed to the reality of the hierarchical Indian social structure and the ways the grievances of the deprived sections can be addressed to raise human dignity democratically.	6,7	1,2
CO6	To understand the international relations of India with the surrounding countries	6,7	1,2

MODULE – I

Evolution of the Indian Constitution: 1909 Act, 1919 Act and 1935 Act. Constituent Assembly: Composition and Functions; Fundamental features of the Indian Constitution.

MODULE – II

Union Government: Executive-President, Prime Minister, Council of Minister
State Government: Executive: Governor, Chief Minister, Council of Minister
Local Government: Panchayat Raj Institutions, Urban Government

MODULE – III

Rights and Duties: Fundamental Rights, Directive Principles, Fundamental Duties

MODULE – IV

Relation between Federal and Provincial units: Union-State relations, Administrative, legislative and Financial, Inter State council, NITI Ayog, Finance Commission of India

MODULE – V

Statutory Institutions: Elections-Election Commission of India, National Human Rights Commission, National Commission for Women

MODULE – VI

India's External Relations: Cold War and Post-Cold War era. What is Foreign Policy? Basic Determinates of Foreign Policy India and its Neighbours India's Extended Neighbourhood in West Asia and South East Asia. India's relations with the United States and Russia. India and the World Organisations India in the 21st century

Note: Documentation of any style is mandatory

REFERENCE BOOKS

1. D.D. Basu, Introduction to the constitution of India, Lexis Nexis, New Delhi
2. Subhash Kashyap, Our Parliament, National Book Trust, New Delhi
3. Peu Ghosh, Indian Government &Politics, Prentice Hall of India, New Delhi
4. B.Z. Fadia & Kuldeep Fadia, Indian Government &Politics, Lexis Nexis, New Delhi

FOURTH SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4S1	Architectural Design – III	1	8	0	9	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To provide skills for functional activities concerning user requirements	1,2,3,4,5, 9,10,12	2,3
CO2	To develop abilities in design in the context of the site	1,2,3,4,5, 9,10,12	2,3
CO3	To understand the socioeconomic factors involved in the design	1,2,3,4,5, 9,10,12	3,6
CO4	To understand the application of knowledge gained from other subjects in design	1,2,3,4,5, 9,10,12	3,6
CO5	To understand the integration of plans and three-dimensional compositions	1,2,3,4,5, 9,10,12	3,6
CO6	To understand the materials, and structure concerning the design	1,2,3,4,5, 9,10,12	3,6

COURSE CONTENT

The design issues to be addressed:

- Organization of functional activities concerning user requirements and the site.
- Relating the system of horizontal and vertical circulation, open spaces, parking, etc.
- Responding to socio-economic factors such as income levels, privacy, territoriality, interaction, etc.
- Considering materials, structure, and services concerning the design proposal.
- Integration of plan forms and three-dimensional compositions.
- Detailing for the physically handicapped and the elderly.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.

At least one major exercise and one minor design/time problem should be given.The final submission shall necessarily include a model for the major project

DESIGN TASKS

Design of a group of buildings and ancillary, set in the context studied in ADS3. Introduction to concepts of shared open space, clustering, community, aggregation and economy.

Emphasis will also be laid on on-site planning.

This shall be a group design exercise with each member handling a different aspect or a different portion of the total problem. Problems aimed at drafting and presentation skills in the 3-D format.

This course shall be fully integrated with the building construction studio with the objective of producing basic working drawings of one or more of the designed buildings up to two storeys. Emphasis shall be laid on clarity of details and architectural expression in functional and constructional elements.

Area of concern/ focus:

- Rural settlements and architecture
- Community-oriented design
- Simple public buildings (not more than Ground+ 2 floors)

Suggestive Typologies/ projects:

Rural projects that involve studies and design at settlement and building level- noon meal centre, market, primary health centre; department store, higher secondary school, campus students centre etc,

REFERENCE BOOKS

1. Chiara Joseph de and Others. Time Savers Standards of Building Types. McGraw– Hill, 1990.
2. Neufert, Ernst. Ernst Neufert Architects Data, Granada Pub. Ltd., London, 2000.
3. Peloquin, Albert. Barrier-Free Residential Design. McGraw-Hill, Inc., New York,1994.
4. Pevsner, Nikolaus. A History of Building Types. Thames and Hudson, London,1976.
5. Shah, S. Charanjit. Architects Hand Book Ready Reckoner. Galogotia Pub., New Delhi, 1996.
6. Untermann, Richard and Snall, Robert. Site Planning for Cluster Housing.
7. A History of Building Types-Nikolays Pevsner.
8. Architect's Hand book-Charanjit. Shah.
9. National Building code

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4S2	Building Materials and Construction – IV	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the building materials glass.	1,7,10	2
CO2	To understand the building materials Painting, Varnishing, Distempering	1,7,10	2
CO3	To understand the use of Steel for Structural and non-structural building components in the construction industry/practice.	1,3,5,10	3
CO4	To understand and find out the reasons for failures in the buildings.	1,3,5,10	2
CO5	To understand damages in the Substructure and apply the appropriate techniques for renovations in the old buildings.	1,3,5,10	3
CO6	To understand damages in the RCC structure and apply the appropriate techniques for renovations in the old buildings.	1,3,5,10	3

MODULE – I

GLASS: Composition of glass, a brief study on manufacture, treatment, properties and uses of glass. Types of glass - float glass, cast glass, glass blocks, and foamed glass. Decorative glass, solar control, toughened glass, wired glass, laminated glass, fire-resistant glass, glass blocks, structural glass - properties and application in the building industry, glazing and energy conservation measures.

MODULE – II

PAINTING, VARNISHING& DISTEMPERS: Painting: Characteristic of an ideal paint, the constitution of paints, types of paints, failure of paint, defects in painting, painting on different surfaces.

Varnishing: Characteristic of a varnish, types of varnish, the process of varnishing, Distemper: Properties of a Distemper, Ingredients of a distemper, process of distempering

MODULE – III

STEEL TRUSSES: types for various spans, tubular steel roofs, monitor roofs, north light roof truss, details of steel–roof trusses. Lantern light, dome light, structural steel practice and drawings as per IS Code. Portal frame, Geodesic principles, cable net and tensile structures.

MODULE – IV

FAILURES: Introduction to building failures: causes of decay and damage in old buildings, issues of maintenance and repair. Preliminary inspection and general observation, decayed elements difference between decay and damage.

MODULE – V

TIMBER: Moisture content, treatment prior to installation, factors reducing the strength of timber, approach to repair and to the timber roofing system.
Bricks: Strength-reducing factors in brickwork, the effect of ageing, weathering, the temperature variation of

brickwork, joints and cracks, construction defects, repair and maintenance.

MODULE – VI

R.C. CONCRETE: Mixing methods at site, structural design for repairs, causes of failure in concrete structures, pressure-grouting.

METHODICAL APPROACH TO REPAIRS: Cracks over openings, sinking and sagging balconies, repairs to decayed floors and floor joints, for example, Jack arch., madras roof terrace, foundation sinking, repairs to walls. Propping, shoring, strutting and underpinning.
Unusual problems: Repairs to large span rooms, waterproofing the roof terraces, leakages from toilets, case studies and site visits.

TEXTBOOKS

1. W.B. Mickay – Building Construction Vol 1 and 3 – Longmans, UK 1981
2. S.C. Rangwala – Engineering materials – Charotar Publishing, Anand.
3. Dr B.C Punmia – Building Construction

REFERENCE BOOKS

1. Barry, R. The Construction of Buildings Vol. 2, 5th ed. East-West Press. New Delhi, 1999.
2. Bindra,S P.and Arora, S P. Building Construction: Planning Techniques and Methods of Construction, 19th ed. Dhanpat Rai Pub. New Delhi, 2000.
3. Hailey and Hancork, D.W. Brick Work and Associated Studies Vol. 2. MacMillan, London, 1979.
4. Moxley, R. Mitchell's Elementary Building Construction, Technical Press Ltd.
5. Sushil Kumar. T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C1	Design of Structures – I	2	0	1	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To familiarise with design philosophies and principles.	1,2,3	3,4,6
CO2	To design and solve problems in context to singly, doubly & flanged beams	1,2,3	3,4,6
CO3	To understand the behaviour of RC elements subjected to flexure, shear, Torsion & bond.	1,2,3	3,4,6
CO4	To demonstrate procedural Knowledge in the design of RCC slabs according to IS coral Provisions & design of staircases	1,2,3	3,4,6
CO5	To understand the behaviour of columns subjected to uniaxial & biaxial bending	1,2,3	3,4,6
CO6	To design and recommend the appropriate type of footing according to site conditions.	1,2,3	3,4,6

MODULE – I

Fundamentals of Limit State Design Method:

A brief introduction to the working stress method, Concept of limit state design philosophy, the principle of the limit state, Advantages of Limit State Method over other methods, Design loads, characteristic load, design strength, characteristic strength, Partial safety factors, Assumptions in the limit state method of design in flexure, Stress–Strain Curves for Concrete and Steel, stress block parameters, limiting moment of resistance, neutral axis; balanced, under and over reinforced sections, IS codal provisions.

MODULE – II

Design of beams by LSM:

Analysis and design of singly and doubly reinforced rectangular beams,
Flanged beams (T & L beams) by Limit State Method.

MODULE – III

Limit State of Collapse in Shear, Torsion & Bond:

The behaviour of rectangular RC beams in shear and torsion codal provisions – Design examples in simply supported, cantilever and continuous beams, including detailing. Concept of bond, bond stress, types of bonds, development length, I.S. code provisions and numerical problems.

MODULE – IV

Design of Slabs & Staircase:

General notes on IS codal provisions
Design of one-way slab - Two-way slab, cantilever slab as per IS-456 codal provisions
Staircase: Components of the staircase, Design of Dog-legged staircase

MODULE – V

Design of Columns:

Definition of column & pedestal, short columns& long columns, assumptions, General notes on IS codal

specifications. Design of short Rectangular, Square and circular columns –Design of Slender columns-Design for Uni axial and Biaxial bending using SP 16 Charts

MODULE – VI

Design of Footings:

Different types of shallow footings, soil pressure distribution below the footings, and IS codal provisions. Design of Square footing, rectangular footing, and Design of rectangular combined footing

NOTE:

1. All designs will be according to Limit State Method
2. IS 456:2000 code & SP 16 Charts to be permitted into the examination hall

Student Activity: Design various structural elements in multistorey buildings and provide detailed drawings with specifications.

The following plates should be prepared by the students.

- Reinforcement particulars of T-beams and L-beams.
- Reinforcement detailing of continuous beams.
- Reinforcement particulars of columns and footings.
- Detailing of One way, Two way and cantilever slabs
- Reinforcement detailing of a dog-legged staircase

TEXTBOOKS

1. Reinforced concrete design by N. Krishna Raju and R.N. Pranesh, New age International Publishers, New Delhi.
2. Subramanian. N," Design of Reinforced Concrete Structures", Oxford University Press, New Delhi,
3. Limit State Design by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications Pvt. Ltd., New Delhi

REFERENCE BOOKS

1. Reinforced concrete design by S.Unnikrishna Pillai &Devdas Menon, Tata Mc. Graw Hill, New Delhi.
2. Varghese P.C, "Limit State Design of Reinforced Concrete", Prentice Hall of India,
3. IS:456-2000, Code of Practice for Plain and Reinforced concrete, Bureau of Indian Standards, New Delhi, India

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C2	History of Architecture – III	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the Industrial revolution and the new building typologies	1,3,6,7, 9,10	2
CO2	To understand the Characteristic styles of modern architecture upto First World war	1,3,6,7, 9,10	2
CO3	To study the Architects and their theories	1,3,6,7, 9,10	2
CO4	To understand the Characteristic styles of modern architecture after the second World war	1,3,6,7, 9,10	2
CO5	To gain knowledge of different design theories and the contributions of Engineers	1,3,6,7, 9,10	2
CO6	To study the development of secular architecture	1,3,6,7, 9,10	2

MODULE – I

INFLUENCE OF THE INDUSTRIAL REVOLUTION

Modernism, utilitarian modernism and neo-modernism, brutalism. Criticisms on the modern movement in India, countering the stigma of colonialism, the neo-vernacular, the community architectural movement, integrating the New and the old, revivalism and post-modernism.

Influence of the Industrial Revolution on building materials, Construction Technology, the evolution of new building types, and increasing user requirements.

MODULE – II

EARLY STYLES OF MODERN ARCHITECTURE

Characteristic styles of modern architecture up to the First World War. Steel structures, Arts and crafts movement, Art Nouveau, Vienna School, Chicago School, Monumentalism, Expressionism, and beginning of RCC.

Theories of John Ruskin, William Morris, Henry Vandevelde, Otto Wagner, Peter Behrens, and Louis Sullivan

MODULE – III

PIONEERS IN ARCHITECTURE (Between the Worlds Wars)

Contributions to Architecture and Theory made by pioneers - Le Corbusier, Frank Lloyd Wright, Walter Gropius, and Mies Van der Rohe in the periods between the Worlds Wars

MODULE – IV

PIONEERS IN ARCHITECTURE (After the Worlds War)

Characteristics of modern architecture after the Second World War. Study of Alvar Aalto, Ero Saarinen,

Richard Neutra, Louis I Kahn, Phillip Johnson, etc.

MODULE – V

DESIGN THEORIES AND CONTRIBUTIONS OF ENGINEERS

Architects like Pier Luigi Nervi, Felix Candela, Buckminster Fuller, and Frei Otto etc.

MODULE – VI

PRE-INDEPENDENCE ARCHITECTURE IN INDIA:

Development of secular architecture from the end of the 18th Century to the middle of the 20th Century

Note: Documentation of any style is mandatory

REFERENCE BOOKS

1. Benevolo, Leonardo. History of Modern Architecture: the tradition of modern architecture Vol.1. Routledge and Kegan Paul, London, 1971.
2. Frampton Kenneth Modern Architecture: A Critical History London: Thomes& Hudson, 1980
3. Benevolo, Leonardo. History of Modern Architecture: the modern movement Vol.2. Routledge and Kegan Paul, London, 1971.
4. Curtis, J.R. William. Modern Architecture since 1900. Prentice-Hall, Inc., New Jersey, 2002.
5. Giedion, Sigfried, Space, Time and Architecture: the growth of a new tradition, 4th ed. Harvard University Press, Cambridge, 1962.
6. Hilberseimer, L. Contemporary Architecture: Its roots and trends. Paul theobald, Chicago, 1964.
7. Pevsner, Nicolaus Oersonem: Pioneers of Modern Design from William Morris to Walter Gropius-
8. Sharp, Dennis. Twentieth-Century Architecture: A Visual History, Facts on File. New York, 1991
9. Norberg schul C., Principles of Modern Architecture, London Andreas papadakes, 2000.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C3	Building Services – II	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand components of fundamental principles of electricity and building wiring system	1,3,5,6, 7,9	2
CO2	To understand the preparation of electrical layout, applications of lighting laws & calculation	1,3,5,6, 7,9	2
CO3	To understand the electrical demand and load estimations, preparation of lighting & electrical scheme	1,3,5,6, 7,9	2
CO4	To understand lighting design, NBC standards, illumination levels, design of a layout	1,3,5,6, 7,9	3
CO5	To study the air conditioning system and its applications	1,3,5,6, 7,9	2
CO6	To understand the typologies of air conditioning system	1,3,5,6, 7,9	2

MODULE – I

FUNDAMENTAL PRINCIPLES OF ELECTRICITY: Voltage, Amperage, wattage, generation, and transmission of power, distribution in cities, HT and LT consumers, Transformers and load calculations, Single and three-phase connections, Indian Electricity rules, Types of Generators, UPS

Building Wiring System: Service wires, metering, light and power circuits. electrical safety devices, MCB, ELCB, distribution boards, wiring methods, ISI Codes and standard materials, Conductors, switchboards, electrical points in general building, pipe earthing, and plate earthing.

MODULE – II

ELECTRIC LAYOUTS: Electrical symbols, NBC, preparation of layouts for residences, offices, Domestic appliances their location in buildings, Types of electric motors and pumps.
Principles of illumination – Visual tasks – Factors affecting visual tasks – Modern theory of light and colour – synthesis of light – Additive and substractive synthesis of colour – Luminous flux – Candle– utilization factor – Solid angles -Depreciation factor – Laws of illumination, inverse square law, Lamber's Cosine law, application of laws in lighting calculations using point by point method.

LIGHT FLUX METHOD: Calculation the number of lamps required for achieving a particular level of illumination. Introduction to power and lighting circuits,

MODULE – III

ELECTRICAL LOAD ESTIMATION: Indian Electricity Rules- relevant codes of practice, energy auditing Building lighting system: artificial illumination, various types of lamps, advantages and disadvantages

Method of lighting, direct, semi-direct, indirect, concealed lighting, spot lighting, task lighting, decorative lighting, rope lights, neon lights, floodlighting, yard lighting, underwater lighting. Preparation of a lighting and electrical scheme

MODULE – IV

LIGHTING DESIGN: Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals, and house lighting. Elementary idea of special features required and minimum level of illumination required for physically handicapped and elderly in building types.

Lighting Calculation: NBC standards, nominal illumination levels in building interiors, lux, lumen, intensity, and lighting schemes.

ELECTRICAL LAYOUT OF SIMPLE BUILDINGS
Electrical layout of a simple residential, school, and commercial building.

MODULE – V

PRINCIPLES OF AIR-CONDITIONING: IAQ, comfort conditions, gas laws, refrigeration cycle, a/c equipment, compressor heat exchangers, condenser, evaporators.

MODULE – VI

TYPES OF AIR-CONDITIONING: single zone, multi-zone, window air conditioners, split air conditioners, ductable air conditioners, package system and central air conditioning, distributive AC system, all air systems and chilled water systems. a/c plant room, AHU's, Building ducting, diffusers and grills, FC units

REFERENCE BOOKS

1. Electrical wiring and Contracting (Vol.1 to Vol.4), London The New era Publishing Company.
2. Dr FrithAbnwos and others, Electrical Engineering hand Book William. J. Guinnesss, Mechanical and Electrical Equipment for Buildings, New York: Willey
3. Bovay. H.E., Handbook of Mechanical and Electrical Systems for Buildings New York: MC Graw Hill

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C4	Landscape Architecture	2	0	1	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the basics and history of Landscape from various countries and styles.	1,4,5,7,8	2
CO2	To Understand the principles of site planning and land use.	1,4,5,7,8	2,3
CO3	To Understand the various types of plants and the implication of design using those elements.	1,4,5,7,8	2,3
CO4	To understand the elements of landscape and the implication of design using those elements.	1,4,5,7,8	2,3
CO5	To understand the landscape construction details and services.	1,4,5,7,8	2,3
CO6	To understand the contemporary concepts and design the urban landscape elements.	1,4,5,7,8	2,3

MODULE – I

INTRODUCTION AND HISTORY OF LANDSCAPE ARCHITECTURE.

Introduction to Landscape Architecture and Role of Landscape design in the built environment. A brief review of Landscape Design and garden design in history in various regions Persian, Spanish, Italian, French, Moghul, English, and Japanese Garden styles.

Changing the perception of man's relationship with nature in various phases of history and its influence on the environment.

A brief review of the evolution of concepts in landscape design after the industrial revolution and increasing awareness of ecological variables in landscape design. Leading to new theories in integrating built spaces into open spaces.

MODULE – II

PRINCIPLES OF SITE PLANNING AND LAND USE

Review of definition applied in typical landscape development situations. Site survey and appraisal – understanding different site characteristics –topography, vegetation, Hydrology, Access, Surroundings, etc. documents, site characteristics, and establishing a relationship with design / Architecture Programme requirements.

Provision of vehicular and pedestrian circulation; parking; street widths; turning radii; street intersections; steps and ramps. Site planning considerations in relation to surface drainage, water systems, sewage disposal, and outdoor electrical systems. Philosophical and design issues related to site development – sitting of buildings, Spatial and contextual relationships of built and outdoor space and circulation, and its relationship to surroundings. Importance of climate and social factors in the development of the site. Process of design development. Identifying functional requirements of the site.

Development of site by mutual exploitation of forms and use of grading principles.

MODULE – III

PLANTS AND DESIGN

Introduction to the study of plants in relation to landscape design and architecture. An overview of the use of plants in history. Study of Plant material – Botanical Nomenclature anatomy and physiology of plant growth study of trees, shrubs, ground cover, and indoor plants in the Indian context.

Design with plants – Basic principles of designs. Plant selection criteria –The physical attribute of plants and their relation to design. Appearance, functional and visual effects of plants in landscape design and the built environment. Selection and management of plant material in relation to the built environment. Garden/landscape furniture and lighting.

MODULE – IV

ELEMENTS IN LANDSCAPE DESIGN

Use of landform, water, and vegetation in landscape design. Hard landscapes: design of paths, roadways streets, terraces, etc., and use of landforms effectively.

Soft landscapes: design of lawns, shrubs, hedges, and trees – in relation to buildings and other landscape elements. Design concepts related to the use of sculpture, outdoor lighting, Architectural features, and street furniture and grouping them into meaningful compositions for visual and functional effects.

MODULE – V

LANDSCAPE CONSTRUCTION AND SERVICES

Study of landforms and their technical expression through grading plans, sections, and earthwork computations. Irrigation systems – sprinkler trickle irrigation, drip irrigation, and laying irrigation networks. Construction of structure in landscape circulation roads, parking, paths, level changes – walls, steps lamps, construction of screens, trellis, wall fences gales decks, pools, etc.

MODULE – VI

Contemporary concepts and concerns and design of open spaces – Urban landscape, Parks, Rural landscape, etc. Introduction to concepts of green architecture and microclimate planning. The role of landscape components in modifying microclimate concerning temperature, humidity, precipitation, and percolation.

NOTE:

Assignment: Simple exercises in using plants and landscape elements. Studio exercise emphasizes the relationship between built forms and outdoor areas and site planning issues.

REFERENCE BOOKS

1. Blake, Alan. Landscape Construction and Detailing. B.T. Batsford Ltd., London,1996.
2. Colvin, Brenda. Land and Landscape.
3. Hatchet, Brian. Planting Design.
4. Harris, C.W. and Dines, T. Nicholas. T.S.S for Landscape Architecture. McGraw Hill, New York, 1995.
5. Laurie, Michael. An Introduction to Landscape, 2nd ed. Prentice-Hall, New Jersey, 1986.
6. Lynch, Kevin. Site Planning. MIT Press, Massachusetts, 1962.
7. John l.Mutloch. Introduction to Landscape Design, 2nded.John Wiley & Sons, Inc, New York,2001
8. Santapau. H. Common Trees. National Book Trust, New Delhi, 1981.
9. Trivedi, P. Pratibha. Beautiful Shrubs. Indian Council of Agricultural Research, New Delhi, 1990.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C5	CULTURAL ARCHITECTURE	2	0	0	2	50	50	100

Cos	Course Outcomes	POs	BTLs
CO1	To learn about Cultural Influences in Ancient India	1,3,6,7, 10	2
CO2	To learn about Architecture & Culture in China & Cambodia	1,3,6,7, 10	2
CO3	To know about Japanese Traditional Architecture & Contemporary Expressions	1,3,6,7, 10	2
CO4	To learn about the Traditional Art & Architecture of Tamil Nadu	1,3,6,7, 10	2
CO5	To learn about the Traditional Art & Architecture of Kerala	1,3,6,7, 10	2
CO6	To learn about the Traditional Art & Architecture of Andhra Pradesh	1,3,6,7, 10	2

MODULE – I

CULTURAL INFLUENCES IN ANCIENT INDIA

Indus valley civilization – Town planning in Mohen jo daro –Tree & mother goddess worship – Harappa and lothal –the great bath, the great granary – sumps, manholes, underground drainage etc.

Symbolism in early Buddhist architecture in India – Stupas at Sanchi and Amaravati – Greek influence in Buddhist architecture – Takht i Bahai. – symbolism in Chaitya halls and Viharas of rock-cut Buddhist architecture. – symbolism in Tibetan Buddhism – manifestation in the architecture of monasteries (gompa) and palaces – Potala palace, Palpung monastery.

MODULE – II

ARCHITECTURE & CULTURE IN CHINA & CAMBODIA

Confucianism, Taoism and Buddhism – ancient Chinese wooden architecture –Concepts of Bilateral symmetry, Enclosure, Hierarchy, Horizontal Emphasis, Cosmology etc. – architectural types – Religious architecture – Pagoda of Fogong, Temple of Heaven pagoda – Basic concepts of feng shui and its applicability to interior design – Cambodia – Khmer belief – Hinduism & Buddhism – Temples at Angkor Wat and Bayon – Khmer house Traditional Japanese house – floor plan

MODULE – III

JAPANESE TRADITIONAL ARCHITECTURE & CONTEMPORARY EXPRESSIONS

Elements of a traditional Japanese house and garden – Machiya, Genkan, tatami. Flexible space modules, fusuma, shoji, the roof made of wood, clay, thatch and tiles – House & garden – dry landscape gardens, Tsukiyama (landscape) gardens, Chaniwa (tea) gardens etc – Architectural evolution during the Nara,

Samurai & later Meiji period - Contemporary expressions – Imperial hotel, Tokyo by F.L.Wright, National Gymnasium, Tokyo by Kenzo Tange – Works of Fumihiko Maki, Arata Isozaki and Tado Ando (Awaji).

MODULE – IV

TRADITIONAL ART &ARCHITECTURE OF TAMILNADU

Structure of a south Indian temple – six divisions in elevation – temple layout illustrating human form delineation of the temple elevation parts in analogy to the human body – Srirangam temple, Gangaikonda Cholapuram temple – traditions in arts & crafts – space, function and climate responsiveness – columns, parapets and cornices – Rajas' palace in Kanadukathan –Nagarathar houses in Karaikudi.

MODULE – V

TRADITIONAL ART & ARCHITECTURE OF KERALA

Salient features of the Thravadu house – Nallukettu, Ettukettu etc. – Thatchu sastra or the science of carpentry – roof wood frame details – Padmanabhapuram palace, Museum building, Trivandrum - Contemporary expressions – Center for development studies by Laurie Baker – projects by Costford – Ashtamudi resort hotel, IIM Kozhikode etc.

MODULE – VI

TRADITIONAL ART & ARCHITECTURE OF ANDHRA PRADESH

Kaccha buildings - Religious practices, beliefs, culture & climatic factors, Chutillu, Manduva houses, thatched Roofs, Courtyard houses Etc.

Note: Documentation and site study of any style/temple is mandatory

REFERENCE BOOKS

1. A.Thampuram "Study of Architecture Forms in Malabar coast" Wiley and Sons Inc

2. George Mitchell - Temple towns of Tamilnadu- Marg publications Bombay 1993

3. Lawrence G. Lin – Chinese Architecture – Academy Edition. London 1989

4. Rayrewal, etal – Architecture in India – Ministere des relations exteriieres , frances

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	AR21B4C6	Digital Studio – I	0	0	3	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To gain knowledge of computer skills	5,8,9,10	2
CO2	To understand the usage of MS Word and MS-PowerPoint	5,8,9,10	2
CO3	To gain knowledge on MS-Exel and complete a project on Ms-Excel ex: Estimation of a Project, BOQ etc.	5,8,9,10	2
CO4	To understand the usage of CAD software and create drawings	5,8,9,10	2
CO5	To study the Setting up the drawing environment	5,8,9,10	2
CO6	To gain knowledge of basic commands	5,8,9,10	2

MODULE – I

INTRODUCTION TO MS OFFICE: Basic and Advanced understanding of MS-Word and MS-Power Point and complete a project each from both the software's ex: Architectural Document, Project Presentation etc.

MODULE – II

INTRODUCTION TO MS-EXCEL: Basic and Advanced understanding of MS-Excel and completing a project on Ms-Excel ex: Estimation of a Project, BOQ etc.

MODULE – III

STARTING AUTO CAD: Introduction to the menu, starting drawings from scratch, Creating and using templates starting drawings with setup wizards. Saving and closing a file.

MODULE – IV

USING COORDINATE SYSTEM: The UCS, Working with Cartesian and polar coordinate systems, using displays with key shortcuts. Setting up the drawing environment: Setting the paper size, Setting units, setting grid limits, drawing limits, Snap controls, Use of paper space, and model space.

MODULE – V

Basic commands dealing with drawing properties: Layer control, change properties, line weight control, etc.

INQUIRY METHODS: Using database information for objects, calculating distance and angle, areas, etc.

DIMENSIONING COMMANDS AND BLOCKS: Dimensioning the objects in linear, angular fashions along with quick time dimensioning, etc. Creating and working with blocks, creating symbols, use of blocks in creating a layout of a residential area. Page setup and Print properties

MODULE – VI
PHOTOSHOP: Photoshop interface, creating and saving images, basic image editing, Photoshop toolbox and tools, using layers, special effects

REFERENCE BOOKS
1. Teyapoovan, T. Engineering Drawing with Auto CAD 2000. Vikas Pub. House Pvt. Ltd. 2. Parker, Daniel and Rice, Habert. Inside Auto CAD Daniel. 1987. 3. Georgeomura, Auto CAD Release 2000. 4. AutoCAD 2010 Textbook-AutoCAD 2010: A Problem-Solving Approach- Customizing AutoCAD

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IV	MC21B302	Essence of Indian Traditional Knowledge	1	0	0	-	-	-	-

COs	Course Outcomes	POs	BTLs
CO1	To identify the concept of Traditional knowledge and its importance.	6,7	1,2
CO2	To explain the need and importance of protecting traditional knowledge.	6,7	1,2
CO3	To illustrate the various enactments related to the protection of traditional knowledge.	6,7	1,2
CO4	To interpret the concepts of Intellectual property to protect traditional knowledge.	6,7	1,2
CO5	To explain the importance of Traditional knowledge in Agriculture and Medicine.	6,7	1,2
CO6	To understand the importance of the Indian ancient education system and its benefits	6,7	1,2

MODULE – I

Introduction to traditional knowledge: Define traditional knowledge, nature and characteristics, scope and importance, kinds of traditional knowledge, Indigenous Knowledge (IK), characteristics, traditional knowledge vis-a-vis indigenous knowledge, traditional knowledge Vs western knowledge traditional knowledge.

MODULE – II

Legal framework and TK: The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, Plant Varieties Protection and Farmer's Rights Act, 2001 (PPVFR Act)
The Biological Diversity Act 2002 and Rules 2004, the protection of traditional knowledge bill, 2016.

MODULE – III

Protection of traditional knowledge: The need for protecting traditional knowledge Significance of TK Protection, the value of TK in the global economy, Role of Government to harness TK.

MODULE – IV

Traditional knowledge and intellectual property: Systems of traditional knowledge protection, Legal concepts for the protection of traditional knowledge, Patents and traditional knowledge, Strategies to increase protection of traditional knowledge

MODULE – V

Traditional Knowledge in Different Sectors: Traditional knowledge and engineering, Traditional medicine system, TK in agriculture, Traditional societies depend on it for their food and healthcare needs, Importance

of conservation and sustainable development of the environment, Management of biodiversity, Food security of the country and protection of TK

MODULE – VI

Education System in India: Education in ancient, medieval and modern India, aims of education, subjects, languages, Science and Scientists of Ancient India, Science and Scientists of Medieval India, Scientists of Modern India

TEXTBOOKS:

1. Traditional Knowledge System in India, by Amit Jha, 2009.
2. Narain, "Examinations in ancient India", Arya Book Depot, 1993
3. Satya Prakash, "Founders of Sciences in Ancient India", Vijay Kumar Publisher, 1989
4. M. Hiriyanna, "Essentials of Indian Philosophy", Motilal Banarsidass Publishers, ISBN 13: 978-8120810990, 2014

REFERENCE BOOKS

1. Knowledge Traditions and Practices of India" Kapil Kapoor1, Michel Danino2.
2. "Science in Samskrit", Samskrita Bharti Publisher, ISBN 13: 978-8187276333, 2007
3. Kapil Kapoor, "Text and Interpretation: The India Tradition", ISBN: 81246033375, 2005
4. "Science in Samskrit", Samskrita Bharti Publisher, ISBN 13: 978-8187276333, 2007
5. NCERT, "Position paper on Arts, Music, Dance and Theatre", ISBN 81-7450 494-X, 200
6. Narain, "Examinations in ancient India", Arya Book Depot, 1993
7. Satya Prakash, "Founders of Sciences in Ancient India", Vijay Kumar Publisher, 1989
8. M. Hiriyanna, "Essentials of Indian Philosophy", Motilal Banarsidass Publishers, ISBN 13: 978-8120810990, 2014

FIFTH SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5S1	Architectural Design – IV	1	5	0	6	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To provide skills for functional activities related to Institutes	1,2,3,4,5, 9,10,12	2,3
CO2	To develop abilities in design w.r.t to contemporary and correlation to the urban structure	1,2,3,4,5, 9,10,12	2,3
CO3	To understand the integration of functional aspects	1,2,3,4,5, 9,10,12	3,6
CO4	To understand the application of landscape and site planning	1,2,3,4,5, 9,10,12	3,6
CO5	To understand the NBC and other relevant codes	1,2,3,4,5, 9,10,12	3,6
CO6	To understand the materials, and structure concerning the design	1,2,3,4,5, 9,10,12	3,6

MODULE – I

The following issues relating to design will be addressed:

- Nature of contemporary institutions, correlation to urban structure.
- Development control and urban infrastructure affecting design.
- Various attitudes to building in the urban context.
- Integration of function: movement, climate, acoustics, structure, and services into the group of buildings.
- Landscaping and site planning
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.

DESIGN TASKS

Design of a multi-functional public building in the urban setting. Introduction to urban development, controls, codes and bye-laws. Exercises in articulation and manipulation of programmed needs, Design methodology, criticism and evaluation of alternative concepts.

Study of an urban environment in use. Urban activities, services and construction methods, and phenomena of social utilization, growth and change shall be the focus of the study. Besides, the reflection on subjects studied in the previous semester strengthens the overall understanding of the multifunctional building's internal and external conditions.

Areas of concern/ focus

Behavioral aspects and user satisfaction socio-cultural aspects designing for the differently abled Building byelaws and rules. Appropriate materials and construction techniques Climatic

Suggestive Typologies/ projects:

Housing Projects- detached, semi-detached, row housing, cluster housing, apartment; housing and facilities for other user groups- Old age Home, orphanage, working women's hostel, home for physically and mentally challenged; Museum/ Art centre, Educational campus, R & D centre, shopping complex etc

REFERENCE BOOKS

1. Marcel Breuer: Building Global Institutions- by Barry Bergdoll (Editor), Jonathan Massey (Editor)
2. Chiara Joseph de and Others. Time Savers Standards of Building Types. McGraw – Hill, 1990.
3. Hand Book of Planning and Design Data.
4. Kirk, Paul Hayden, and Sternberg, D. Eugene. Doctors' Offices and Clinics, 2nd ed. Reinhold Pub., USA, 1960.
5. Konya, Allan. Libraries: A Briefing and Design Guide. The Architectural Press, London, 1986.
6. Neufert, Ernst. Ernst Neufert Architects Data. Granada Pub. Ltd., London, 2000.
7. Pevsner, Nikolaus. A History of Building Types. Thames and Hudson, London, 1976.
8. Rosenfield, Isadore. Hospital Architecture and Beyond. Van Nostrand Reinhold,New York, 1969.
9. Stone, G. Louis. Institutional Buildings Architecture of Controlled Environment.
10. Tergsone, W.R. Practical Laboratory Planning.
11. Wild, Friedemann, Libraries for Schools and Universities. Van Nostrand Reinhold,New York, 1972.
12. Time savers standards of Building Types-Joseph de Chiara & others.
13. A History of Building Types-Nikolays Pevsner.
14. Architect's Data-Ernst Neufert.
15. Architect's Hand book-Charanjit. Shah.
16. National Building code

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5S2	Architectural Conservation	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study history and the need for conservation	1,3,4,5, 7,8	2
CO2	To understand the factors affecting the Architectural aspects of historic cities	1,3,4,5, 7,8	2
CO3	To understand the values and ethics of conservation	1,3,4,5, 7,8	2
CO4	To gain knowledge on Charters in the development of Conservation	1,3,4,5, 7,8	2
CO5	To understand the components of the conservation, and make case studies on the historical building	1,3,4,5, 7,8	2,4
CO6	The course is intended to give a detailed project report on a conservation project	1,3,4,5, 7,8	2,4

MODULE – I

INTRODUCTION - Definition of the term Conservation, Heritage, Culture in Architectural context - Various stages in conservation such as Preservation, Restoration, Adaptation, and Consolidation

Study of the history of the Conservation movement -Need for conservation in a modern context.

MODULE – II

HISTORIC CITIES - Factors affecting the Architectural aspects of historic cities- geographical, social, cultural, and religious. Case Study of historic cities- Shahjahanabad, Madurai, Pondicherry

MODULE – III

ETHICS OF CONSERVATION - Values in conservation- Social, Economic, Religious and Use Values – Planning guidelines - Legislation related to Architectural Conservation.

MODULE – IV

CHARTERS IN DEVELOPMENT OF CONSERVATION – Conservation Agencies like ASI, INTACH, Research and Funding Organisations like UNESCO – Components in conservation: Inventory, Listing, Documentation, Education, Community Participation and creating public awareness.

MODULE – V

CASE STUDIES: Conservation Projects in Indian and International Contexts. Emerging trends in Conservation Practices. Heritage repairs and restoration

MODULE – VI
PROJECT REPORT: Give a detailed project report on a conservation project using your desktop and case studies information and give your perspective on how to conserve the selected project.

REFERENCE BOOKS

1. The Architecture of Towns and Cities – Paul do Spreiregen.
2. Urban Renewal in American Cities – Scott Greet.
3. Character of Towns – Roy Workhest.
4. Conservation of European cities, Donald Appleyard, 1979
5. Architectural Heritage of Pondicherry, INTACH publication
6. Conservation of Historic Buildings – Bernard Fielden.
7. INTACH Handbook – INTACH Publications

Semester	Course Code	Course Title	L	T	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5C1	Design of Structures – II	2	0	1	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the various types of connections and analyse the strength of a joint.	1,2,3,10	2, 4
CO2	To design the Steel Beams under various conditions	1,2,3,10	4, 6
CO3	To understand the Design the Built-up sections	1,2,3,10	2, 6
CO4	To design and analyse tension members	1,2,3,10	2, 4, 6
CO5	To know about the design of steel Columns for various sections	1,2,3,10	2, 6
CO6	To understand the design of purlins	1,2,3,10	2, 6

MODULE – I

INTRODUCTION: Steel, manufacturing of steel, types of steel, classification of rolled steel sections, mechanical properties of steel, stress-strain relationship, loads, methods of design.

CONNECTIONS: Introduction- types of joints, failure and strength of assumptions, the strength of the joint, efficiency-Assumptions – failure of Bolted joints – Strength and Efficiency of Bolted Joints – Types – Design of Bolted Joints for Axially Loaded Members (Excluding eccentric connections)-Types of welded joints design of filet weld (Excluding eccentric connections)

MODULE – II

STEEL BEAMS: Design of simple beams including a check for shear and deflection for laterally supported and unsupported conditions, analysis of simple beam from strength and stiffness considerations

MODULE – III

BUILT-UP BEAMS: Design of built-up beams with flange plates only-Introduction to plate girders (No Design calculations)

MODULE – IV

AXIALLY LOADED TENSION MEMBERS: Introduction, net effective areas, analysis and design of tension members.

MODULE – V

COMPRESSION MEMBERS: Introduction, types and shapes of compression members, theory of columns, slenderness ratio, Analysis and design of axially loaded steel columns-introduction to lacings and battened columns(no design calculations).

MODULE – VI

PURLINS: Introduction, Dead load, live load and wind loads, design of angle purlin and I-section purlin

Note: The students should prepare the following plates.
Plate 1 Detailing of simple beams including laterally supported and unsupported beams.
Plate 2 Detailing of built-up beams.
Plate 3 Detailing of Columns.
Plate 4 Detailing of purlins.

FINAL EXAMINATION PATTERN: The end examination paper should consist of Part A and Part B. Part A consist of two questions in Design and Drawing out of which one question is to be answered. Part B should consist of five questions on the design out of which three are to be answered. Weightage for Part – A is 40% and for Part- B is 60%.

Codes/Tables:
IS Codes:
1) IS -800 – 2007
2) IS – 875 – Part III
3) Steel Tables to be permitted into the examination hall.

TEXTBOOKS

1. Bhavikatti S.S, (2010) Design of steel structures IK international publishing house.
2. Limit State Design of steel structures by S.K. Duggal, Tata Mcgraw Hill, New Delhi
3. Limit state design of Steel Structures by Subramanyam. N, Oxford University Press, New Delhi
4. Comprehensive Design of Steel Structures, Punmia, A.K Jain, Lakshmi Publications, Delhi 2009
5. Ramachandra S., "Design of Steel Structures", Standard Book House, Delhi, 2006
6. Composite Structures of Steel & Concrete: Beams, Slabs, Columns & Frames for buildings, Volume- 1, R.P Johnson,2013

REFERENCE BOOKS

1. IS 800:2007 General Condition in Steel – Code of practice
2. Johnson R.P., Composite Structures of Steel and Concrete, Blackwell Scientific Publications (Second Edition), UK, 2012

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B4C2	History of Architecture – IV	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the post-independence architecture	1,3,6,7, 9,10	2
CO2	To understand the Characteristic styles of modern architecture	1,3,6,7, 9,10	2
CO3	To study the Indian Architects and their theories	1,3,6,7, 9,10	2
CO4	To understand the sustainable practices in architecture in India	1,3,6,7, 9,10	2
CO5	To gain knowledge of different design theories and the contributions of Architects	1,3,6,7, 9,10	2
CO6	To study the theories of post-modernism in the rest of the world	1,3,6,7, 9,10	2

MODULE – I

POST-INDEPENDENCE ARCHITECTURE

Contemporary trends in architecture of India after Independence. Influence of Le Corbusier and Louis. I.Khan.

MODULE – II

CHARACTERISTIC STYLES OF MODERN ARCHITECTURE

Theory and works of Achyut Kanvinde, J.A. Stein, Habib Rehman etc. Contributions made by Pioneers - Charles Correa and B.V. Doshi. Anant Raje, Raj Rewal

MODULE – III

DESIGN THEORIES AND WORKS OF CONTEMPORARY ARCHITECTS

Uttam Jain, Hasmukh Patel, including Chandravarkar and Thacker, Jaisim, Anil Laul, Shirish Beri, Romi Khosla, Ranjit Sabiki, Shashi Bhooshan and Sanjay Mohe.

MODULE – IV

SUSTAINABLE PRACTICES IN INDIA

Familiarisation of architecture at Auroville and Laurie Baker's work in Kerala. Sustainable practices in architecture and their implications in India.

MODULE – V

DESIGN THEORIES AND WORKS OF CONTEMPORARY ARCHITECTS

Design Theories and works of Charles Moore, Michael Graves, Richard Meyer, Aldo Rossi, Cesar Pelli, I.M. Pei, Yamasaki, Peter Eisenman, Hassan Fathy, Geoffery Bawa, Norman Foster, Renzo Piano, Richard Rogers, Frank Gehry, Zaha Hadid, Santiago Calatrava, Tadao Ando etc.

MODULE – VI

THEORIES OF POSTMODERNISM

Contemporary trends in the rest of the world architecture. Theory of Post Modernism.

Note: Documentation of any style is mandatory

REFERENCE BOOKS

1. Benevolo, Leonardo. History of Modern Architecture: the tradition of modern architecture Vol.1. Routledge and Kegan Paul, London, 1971.
2. Frampton Kenneth Modern Architecture: A Critical History London: Thomes& Hudson, 1980
3. Benevolo, Leonardo. History of Modern Architecture: the modern movement Vol.2. Routledge and Kegan Paul, London, 1971.
4. Curtis, J.R. William. Modern Architecture since 1900. Prentice-Hall, Inc., New Jersey, 2002.
5. Giedion, Sigfried, Space, Time and Architecture: the growth of a new tradition, 4th ed. Harvard University Press, Cambridge, 1962.
6. Hilberseimer, L. Contemporary Architecture: Its roots and trends. Paul theobald, Chicago, 1964.
7. Pevsner, Nicolaus Oersonem: Pioneers of Modern Design from William Morris to Walter Gropius-
8. Sharp, Dennis. Twentieth-Century Architecture: A Visual History, Facts on File. New York, 1991
9. Norberg schul C., Principles of Modern Architecture, London Andreas papadakes, 2000.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5C3	Human Settlements and Town Planning	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand Urban & rural settlements, community growth and its influence on architecture	1,2,3,6, 7,8,10	2
CO2	To understand urbanization, low- & high-density housing, social surveys and transportation	1,2,3,6, 7,8,10	2
CO3	To understand new concepts of green belts, satellite towns and growth patterns	1,2,3,6, 7,8,10	2
CO4	To understand town forms and the development of urban planning	1,2,3,6, 7,8,10	2
CO5	To understand land use classifications, survey formats, govt. norms.	1,2,3,6, 7,8,10	2
CO6	To understand the method of planning and layout preparation	1,2,3,6, 7,8,10	2

MODULE – I

HISTORIC EVALUATION: Brief review of the origin of early human settlements, and factors responsible. Development of various settlement forms. Types of settlements (urban and rural). Land use and factors influencing it in urban and rural settlements

SOCIOLOGICAL ASPECTS: Essential elements of society in Rural and Urban Communities, Growth of Sociocultural thought through the ages.
Influence of religion and culture on domestic and civil architecture.

MODULE – II

URBANIZATION: Facts, Theories. Socio-spatial problems of migrants, slums, high- and low-density housing; high rise in living such as isolation, alienation, accessibility, conflicts, etc as related to planning and design of buildings in different areas of the city.

TRANSPORTATION AND COMMUNICATION: potential and limitations of roadways, railways, airways, and waterways in the development of a settlement.

MODULE – III

PRINCIPLES OF EKISTICS: Brief introduction to the theory of "Ekistics".
Introduction to the concepts of green belts, satellite towns, neighbourhoods, and roads in solving some of the problems in urban development. Indian context: Growth pattern of urban and rural settlements; problems and potentials.

MODULE – IV

TOWN FORMS: A brief introduction to the implication of town forms in urban planning and development processes. National, regional, urban, rural, local, etc.
Basic methodology for planning for industrial, residential, and recreational areas.

MODULE – V

A general and introductory study of inputs, objectives, preparation, and outputs of a Master plan for a city; Meaning and use or implication of O-D surveys, desire line diagrams trip generation, attraction, distribution, and modal split.
Introduction to housing and community facilities; the role of F.S.I, densities in housing.
Densities in housing and development control rules and building byelaws, GO's, Distribution

MODULE – VI

REDEVELOPMENT: A brief introduction to redevelopment schemes and urban renewal, the problem of slum and shanty areas, and a review of the concepts regarding solutions: clearance, rehabilitation, and improvement.
At least one exercise related to the preparation of a layout for a residential neighbourhood of about 5000 populations.

REFERENCE BOOKS

1. Bhagiratha Rao, E.L. Land Acquisition Manual in Andhra Pradesh.
2. Buch, N. Mahesh. Planning the Indian city.
3. Chand, Mahesh &Puri, Vinay Kumar. Regional Planning in India. Allied Pub. Ltd., Bombay, 1990.
4. Doxiadis, C.L. Ekistics: Introduction to the science of Human Settlement.
5. Gallion, B. Arthur & Eisner, Simon. Urban Pattern: City Planning & Design, 5th ed. Van Nostrand Reinhold, New York, 1986.
6. Hyderabad Urban Development Authority. Hyderabad Urban Development Authority, HUDA, 1981.
7. Khosla, R.K. Urban and Rural Development in India.
8. Patterson, T. William. Land-use Planning Techniques of Implementation.
9. Rama Reddy, Padala& Srinivas Reddy, Padala. Commentates on Hand Reforms Laws in Andhra Pradesh.
10. Rame Gowda, K.S. Urban and Regional Planning. Univ. of Mysore, Mysore, 1972.
11. Rangwala, S.C. & Others. Town Planning, 18th ed. Charotar Pub. House, Anand, 2003.
12. Rappoport, Amos. House, Form, and Culture.
13. Singh, Alok Kumar, & Others (ed). Strategies in Development Planning.

Semester	Course Code	Course Title	L	T	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5C4	Digital Studio – II	0	0	3	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the digital theory	5,8,9,10	2
CO2	To understand the territory of computational design through its theoretical vocabulary and relevant histories.	5,8,9,10	2
CO3	To understand the importance of SketchUp	5,8,9,10	2
CO4	To understand all the tools and toolbars of Sketchup	5,8,9,10	3
CO5	To study and apply commands and create scene setup	5,8,9,10	3
CO6	To understand Organic modelling and 3d printing to explore biomimetics	5,8,9,10	3

MODULE – I

Introduction to digital theory and this unit equips students with an understanding of the territory of computational design through its theoretical vocabulary and relevant histories.
Making Architectural vector diagrams to explore design and for digital communication using vector applications like CorelDraw, Illustrator, Photoshop etc.

MODULE – II

Introduction to Sketchup: Understanding all the tools and toolbars of Sketchup, Advanced understanding of Sketchup UI and doing basic geometrical shapes and playing with all the SketchUp workplace.

MODULE – III

Scene setup involves arranging virtual objects, lights, cameras, and other entities on a scene which will later be used to produce a still image or an animation. Image processing and video editing to create Architectural walkthroughs. Digital solar studies.
Completely a small residential block including a site in Sketchup

MODULE – IV

Building information modelling; using 3-dimensional, real-time, dynamic building modelling software to increase productivity in building design and construction. The process produces the Building Information Model (also abbreviated BIM), which encompasses building geometry, spatial relationships, geographic information, and quantities and properties of building components.

Design and documentation using building information modelling applications like Revit Architecture, ArchiCAD, Bentley Architecture, etc.

MODULE – V

3D modelling and different types of methods in 3D modelling like polygonal modelling, NURBS

modelling, subdivision surface modelling, and building information modelling, etc. to design and test Architectural built environments virtually.
Understanding the new emerging concepts in Architecture i.e. VR, AR, MR etc.

MODULE – VI

Introduction to Organic modelling and 3d printing to explore biomimetics and emergent concepts in the field of architecture and design by using advanced computational technologies

REFERENCE BOOKS

1. Catalytic Formations: Architecture and Digital Design. Ali Rahim
2. BIM Handbook: A Guide to Building Information Modelling for Owners, Managers, Designers, Engineers, and Contractors- Chuck Eastman
3. Building Information Modelling – Willem Kymmell

Professional Electives – I

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5E1	Vernacular Architecture	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To learn and understand Dravidian culture, art and architecture	1,3,6,7, 9,10	2
CO2	To understand the settlement planning of Kerela	1,3,6,7, 9,10	2
CO3	To learn the housing styles of the western region	1,3,6,7, 9,10	2
CO4	To understand the housing styles of Gujarat and Goa	1,3,6,7, 9,10	3
CO5	To understand the north-eastern style of architecture in India	1,3,6,7, 9,10	3
CO6	To understand the north-eastern style architecture – UP, Bengal, Nagaland	1,3,6,7, 9,10	3

MODULE – I

DRAVIDIAN SOUTH – 01

Planning aspects, materials of construction, Constructional details & Settlement Planning of Kerala – Nair houses (Tarawads), Kerala Muslim houses (Mappilah houses), Temples, Palaces, and theatres Thattchushastra.

MODULE – II

DRAVIDIAN SOUTH – 02

TamilNadu – Toda Huts, & Palaces
Karnataka – Gutthu houses (land-owning community), Kodava ancestral home (Aynmane)
Andhra Pradesh –Kaccha buildings
Telangana – Gadhis and forts

MODULE – III

WESTERN REGION -01

Planning aspects, Materials used, Constructional details, and Climatic factors influencing the planning of Jat houses for the farming caste, Bhungas(Circular Huts), and Havelis (Pukka houses) of Rajasthan

MODULE – IV

WESTERN REGION - 02

Pol houses of Ahmedabad - Primitive forms, Symbolism, Colour, Folk art, etc in the architecture of the Desert settlements and houses of Kutch & Gujarat state.

Vernacular architecture of Goa.

MODULE – V

NORTHERN AND EASTERN INDIA

Kashmir – Typical Kutcha houses, mosque, Dhoongas (Boathouses), Ladakhi houses, bridges, Himachal Pradesh – Kinnaur houses

MODULE – VI

NORTHERN AND EASTERN INDIA – 02

Uttar Pradesh – Domestic housing in Uttar Pradesh

Bengal – Bangla (Rural house form), Aat Chala houses – change from Bangla to Bungalow, Kutcha & Pucca The architecture of Bengal. Nagaland – Naga houses & Naga village, Khasi houses

NOTE:

Studies are to be taken up in groups in any one of the different regions indicated above. Field visits, documentation to be taken up and a Report to be prepared based on literature review and field visit.

Reports should include factors influencing planning aspects, religious practices and beliefs, culture & climatic factors, materials of construction, and constructional details. Field visits may be planned in the preceding vacation periods/clusters of holidays so as not to disturb class work.

REFERENCE BOOKS

1. The Architecture of the Indian desert, Kulbushan Jain & Meenakshi Jain, Aadi Centre, Ahmedabad
2. The Royal Palaces of India, George Michell, Thames and Hudson Ltd., London
3. Chettiar Heritage, S.Muthiah, MeenakshiMeyappan, Visalakshmi Ramaswamy, Lokavani - Hallmark Press Pvt. Ltd., Chennai
4. Encyclopedia of Vernacular Architecture of the World, Cambridge University Press
5. Havali – Wooden houses & mansions of Gujarat, V.S.Pramar, Mapin Publishing Pvt. Ltd., Ahmedabad
6. The Tradition of Indian architecture – Continuity & Controversy – Change since 1850, G.H.R.Tillotsum Oxford University Press, Delhi
7. VISTARA – The architecture of India, Carmen Kagal. Pub: The Festival of India, 1986.
8. House, Form & Culture, Amos Rappoport, Prentice Hall Inc, 1969.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5E2	Universal Design	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the provisions of the persons with disabilities Act and the types of disabilities	1,3,6,7, 9,10	1,2
CO2	To understand the Initiatives taken by the global and international level for the protection of rights of the disabled and also the elderly person.	1,3,6,7, 9,10	1,2
CO3	To study the National Institutes, and agencies involved in disabled welfare.	1,3,6,7, 9,10	1,2
CO4	To understand the principles in Architecture for creating friendly environments.	1,3,6,7, 9,10	2,3
CO5	To understand the provisions needed for disabled people in public spaces and to implement them in the designs.	1,3,6,7, 9,10	2,3
CO6	To study the details of ramps, wheelchairs, etc needed in the designing of public buildings.	1,3,6,7, 9,10	2,3

MODULE – I

Introduction to Provisions of persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, Type of disabilities - Orthopaedic, Hearing, Visual Impairments, National Policy for provisions for elderly persons, Concept of equal opportunity, human rights, social justice and empowerment of physically challenged persons.

MODULE – II

Introduction to similar efforts in other countries. Initiatives at global and international levels for the protection of rights of the disabled and also the elderly person. American Disabilities Act 1990 etc.

MODULE – III

Information on various types of national Institutes, agencies, and professional bodies involved in disabled welfare, associated norms, and standards thereof. The role of NGOs, professionals, and outreach.

MODULE – IV

Principles of Universal Design; Design principles in Architecture for creating environments friendly for various types of physically challenged persons. Barrier-free concept Educational Institutions, Hospitals, and Transportation terminals such as buses, railway stations, and airports for barrier-free spaces. Study of Standards as given in TSS, TCPO, CPWD, ADA, etc., and others.

MODULE – V

Provisions in public spaces and site planning – parks, playgrounds, public transportation, parking lots, Details of sidewalks, road intersections, and access to public toilets.

MODULE – VI
Provisions in the design of public buildings - Details in, ramps, guide rails, lifts, dimensions of wheelchairs, accessibility in public buildings, Signage, audio-visual facilities, etc. Design of Toilets and interior spaces for use of the physically challenged.

REFERENCE BOOKS

1. Micheal J. Bednar. “Barrier Free Environments”, Dowden, Hutchinson and Ross, I've 1977.
2. Ministry of Urban Affairs and Employment. Central Public Works Department, India, “Guidelines and Space Standards for Barrier-Free Environment for Disabled and Elderly Person, 1998.
3. Unnati. “Design Manual for a Barrier-Free Built Environment”, Handicap International, December 2004

Open Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
V	AR21B5O1	ART & DESIGN PARADIGM	2	0	0	2	100	0	100

COs	Course Outcomes	POs	BTLs
CO1	To study the basic concepts of art & design paradigm	1,3,6,9, 10	2
CO2	To understand art design and natural phenomena	1,3,6,9, 10	2
CO3	To compare and contrast functional and object-oriented designs past and present.	1,3,6,9, 10	2
CO4	To understand refine and express art & design in terms of simple & complex patterns.	1,3,6,9, 10	2
CO5	To explore existing documentation to describe and use existing libraries	1,3,6,9, 10	2
CO6	To choose, include and implement design patterns appropriately to design solutions to problems	1,3,6,9, 10	2

MODULE – I

INTRODUCTION: Introduction to Art & Design – Introduction to design paradigm – Recognizing Paradigm – Patterns, Art & Design relationship.

MODULE – II

DESIGN & NATURAL PHENOMENON: Design & Natural Phenomenon– Features – Patterns – Principles of design - Paradigm in Nature – Biomimicry – Wealth of nature's design – golden ratio– Paradigm in Human Body-vision, perception, scale& proportion, user experience.

MODULE – III

SCIENCE OF DESIGN: Brief Historical Outlook – Modern Design – Contemporary Design – Ways of designing and development – Form follows function. Fully Integrated Thinking (FIT) tool – traditional site analysis by incorporating a 'deep understanding of the local ecologies'.

MODULE – IV

SIMPLE SHAPE & COMPLEX PARADIGMS: Understand basic geometry – Simple Paradigms - Ball, Disc, Tube, Coil, Spiral, Jar bottle etc. – Complex Paradigms - Combination of multiple simple paradigms – Objects within objects - Peas, Egg, Coconut etc.

MODULE – V

APPLICATION OF PARADIGM: Prominent Personalities and Artworks – approach for developing

concepts in Art & Design – Prominent personalities: Biomimetic approach- Kilmer's design process –Le Corbusier, Santiago Calatrava etc. – Prominent Works: Chhatrapati Shivaji International Airport – National Aquatics Centre, Beijing Lotus Temple Delhi, etc.

MODULE – VI

CASE STUDY/ DESIGN: Develop a concept/ prototype based on the science of Design.

TEXTBOOKS

1. Wake, Warren K., Design Paradigms A Source for Creative Visualization, New York: John Wiley & Sons, 2000
2. Hargroves, K. D.& Smith, M. H.(2006). Innovation inspired by nature Biomimicry. Ecos,(129)
3. Fuller, R.Bucminster.Synergetics: Explorations in the Geometry of Thinking, New York: Macmillan Pub. 1975,'82
4. Hensel, Michael., Menges, Achim., Weinstock, Michael. Emergent Technologies and Design: Towards a Biological Paradigm for Architecture. United Kingdom: Taylor & Francis, 2013.
5. Parks, John A. Universal Principles of Art: 100 Key Concepts for Understanding, Analyzing, and Practicing Art. United States: Rockport Publishers, 2014.
6. How Art Works: The Concepts Visually Explained. United Kingdom: Dorling Kindersley Limited, 2022.

REFERENCE BOOKS

1. Rowe, Peter G. Design Thinking, Cambridge, MA: MIT Press 1987
2. Fuller, R.Buckminster. Inventions: The Patented Works of R. Buckminster Fuller, New York:St. Martin's Press, 1983
3. RowRoukes, Nicholas. Design Synecties: Stimulating Creativity in Design, Worcester, MA: Davis Pub. 1988
4. Bueciarelli, Louis L. Designing Engineers, Cambridge, MA: MIT Press 1994

SEMESTER	Course Code	Course Title	L	T	P/ S	C	Int. Marks	Ext. Marks	Total Marks
V	GN21B5CSP	Community Service Project	(During Vacation) 180 hours			4	100	–	100

COs	Course Outcomes	POs	BTLs
	The student will be able to		
CO1	Involve in community development and service activities and applies the experience to personal and academic development.		

Introduction:

- Community Service Project is an experiential learning strategy that integrates meaningful community service with instruction, participation, learning and community development.
- Community Service Project involves students in community development and service activities and applies the experience to personal and academic development.
- Community Service Project is meant to link the community with the college for mutual benefit. The community will be benefited from the focused contribution of the college students to the village/ local development. The college finds an opportunity to develop social sensibility and responsibility among students and also emerge as a socially responsible institution.

Objective:

Community Service Project should be an integral part of the curriculum, as an alternative to the 2 months of Summer Internships / Apprenticeships / On Job Training, whenever there is an exigency when students cannot pursue their summer internships.

The specific objectives are;

- To sensitize the students to the living conditions of the people who are around them,
- To help students to realize the stark realities of society.
- To bring about an attitudinal change in the students and help them to develop societal consciousness, sensibility, responsibility and accountability.
- To make students aware of their inner strength and help them to find new /out-of-box solutions to social problems.
- To make students socially responsible citizens who are sensitive to the needs of the disadvantaged sections.
- To help students to initiate developmental activities in the community in coordination with public and government authorities.
- To develop a holistic life perspective among the students by making them study culture, traditions, habits, lifestyles, resource utilization, wastages and its management, social problems, public administration system and the roles and responsibilities of different persons across different social systems.

Implementation of Community Service Project:

- Every student should put in 6 weeks for the Community Service Project during the summer vacation.
- Each class/section should be assigned a mentor.
- Specific Departments could concentrate on their major areas of concern.
- A log book has to be maintained by each of the students, where the activities are undertaken/involved to be recorded.
- The logbook has to be countersigned by the concerned mentor/faculty in charge.
- Evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member.

- The final evaluation is to be reflected in the grade memo of the student.
- The Community Service Project should be different from the regular programmes of NSS/NCC/Green Corps/Red Ribbon Club, etc.
- Minor project reports should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college.
- Award of marks shall be made as per the guidelines of Internship/apprentice/on-the-job training.

Procedure

- A group of students or even a single student could be assigned to a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, to enable them to commute from their residence and return by evening or so.

- The Community Service Project is a twofold one –
    - First, the student/s could conduct a survey of the habitation, if necessary, in terms of their domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the Village or Ward volunteers, rather, it could be another primary source of data.
    - Secondly, the student/s could take up a social activity, concerning their domain or subject area. The different areas could be like this –

Agriculture	Law & Order
♣ Health	♣ Excise and Prohibition
♣ Marketing and Cooperation	♣ Mines and Geology
♣ Animal Husbandry	♣ Energy
♣ Horticulture	♣ Internet
♣ Fisheries	♣ Free Electricity
♣ Sericulture	♣ Drinking Water
♣ Revenue and Survey	♣ Irrigation
♣ Natural Disaster Management	

EXPECTED OUTCOMES

BENEFITS OF COMMUNITY SERVICE PROJECT TO STUDENTS

Learning Outcomes

- Positive impact on students' academic learning
- Improves students' ability to apply what they have learned in "the real world"
- Positive impact on academic outcomes such as demonstrated complexity of understanding, problem analysis, problem-solving, critical thinking, and cognitive development
- Improved ability to understand complexity and ambiguity.

Personal Outcomes

- Greater sense of personal efficacy, personal identity, spiritual growth, and moral development
- Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills.

Social Outcomes
- Reduced stereotypes and greater inter-cultural understanding.
- Improved social responsibility and citizenship skills.
- Greater involvement in community service after graduation.

Career Development
- Connections with professionals and community members for learning and career opportunities.
- Greater academic learning, leadership skills, and personal efficacy can lead to greater opportunity.

Relationship with the Institution
- Stronger relationships with faculty.
- Greater satisfaction with college.
- Improved graduation rates.

BENEFITS OF COMMUNITY SERVICE PROJECT TO FACULTY MEMBERS
- Satisfaction with the quality of student learning.
- New avenues for research and publication via new relationships between faculty and community.
- Providing networking opportunities with engaged faculty in other disciplines or institutions.
- A stronger commitment to one's research.

BENEFITS OF COMMUNITY SERVICE PROJECTS TO COLLEGES AND UNIVERSITIES
- Improved institutional commitment.
- Improved student retention.
- Enhanced community relations.

BENEFITS OF COMMUNITY SERVICE PROJECT TO COMMUNITY
- Satisfaction with student participation.
- Valuable human resources needed to achieve community goals.
- New energy, enthusiasm and perspectives applied to community work.
- Enhanced community-university relations.

SUGGESTIVE LIST OF PROGRAMMES UNDER THE COMMUNITY SERVICE PROJECT

The following is the recommended list of projects for Engineering students. The lists are not exhaustive and open for additions, deletions and modifications. Colleges are expected to focus on specific local issues for this kind of project. The students are expected to carry out these projects with involvement, commitment, responsibility and accountability.

The mentors of a group of students should take the responsibility of motivating, facilitating, and guiding the students. They have to interact with local leaders and people and appraise the objectives and benefits of this kind of project. The project reports shall be placed on the college website for reference. Systematic, Factual, methodical and honest reporting shall be ensured. For Engineering Students

1. Water facilities and drinking water availability	21. Plant diseases
2. Health and hygiene	22. Yoga awareness and practice
3. Stress levels and coping mechanisms	23. Healthcare awareness programmes and their impact

4. Health intervention programmes	24. Use of chemicals on fruits and vegetables
5. Horticulture	25. Organic farming
6. Herbal plants	26. Crop rotation
7. Botanical survey	27. Floury culture
8. Zoological survey	28. Access to safe drinking water
9. Marine products	29. Geographical survey
10. Aquaculture	30. Geological survey
11. Inland fisheries	31. Sericulture
12. Animals and species	32. Study of species
13. Nutrition	33. Food adulteration
14. Traditional healthcare methods	34. Incidence of Diabetes and other chronic diseases
15. Food habits	35. Human genetics
16. Air pollution	36. Blood groups and blood levels
17. Water pollution	37. Internet Usage in Villages
18. Plantation	38. Android Phone usage by different people
19. Soil protection	39. Utilisation of free electricity to farmers and related issues
20. Renewable energy	40. Gender ratio in schooling level- observation.

Complementing the community service projects the students may be involved to take up some awareness campaigns on social issues/special groups.

The suggested list of programmes are:
Programmes for School Children
1. Reading Skill Programme (Reading Competition)
2. Preparation of Study Materials for the next class.
3. Personality / Leadership Development
4. Career Guidance for X class students
5. Screening Documentary and other educational films
6. Awareness Programme on Good Touch and Bad Touch (Sexual abuse)
7. Awareness Programme on Socially relevant themes.

Programmes for Women's Empowerment
1. Government Guidelines and Policy Guidelines
2. Women's Rights
3. Domestic Violence
4. Prevention and Control of Cancer
5. Promotion of Social Entrepreneurship

General Camps
1. General Medical camps
2. Eye Camps
3. Dental Camps
4. Importance of protected drinking water
5. ODF awareness camp
6. Swatch Bharath
7. AIDS awareness camp
8. Anti-Plastic Awareness
9. Programmes on the Environment
10. Health and Hygiene
11. Hand wash programmes
12. Commemoration and Celebration of important days.

Programmes for Youth Empowerment
1. Leadership
2. Anti-alcoholism and Drug addiction
3. Anti-tobacco
4. Awareness of Competitive Examinations
5. Personality Development

Common Programmes
1. Awareness of RTI
2. Health intervention programmes
3. Yoga
4. Tree plantation
5. Programmes in consonance with the Govt. Departments

Role of Students:
- Students may not have the expertise to conduct all the programmes on their own. The students then can play a facilitator role.
- For conducting special camps Health-related, they will be coordinating with Governmental agencies.
- As and when required the College faculty themselves act as Resource Persons.
- Students can work in close association with Non-Governmental Organizations like Lions Club, Rotary Club, etc or with any NGO actively working in that habitation.
- And also with the Governmental Departments. If the programme is rolled out, the District Administration could be roped in for the successful deployment of the programme.
- An in-house training and induction programme could be arranged for the faculty and participating students, to expose them to the methodology of Service Learning.

TIMELINE FOR THE COMMUNITY SERVICE PROJECT ACTIVITY
Duration: 8 weeks
1. Preliminary Survey (One Week)
- A preliminary survey including the socio-economic conditions of the allotted habitation to be conducted.
- A survey form based on the type of habitation is to be prepared before visiting the habitation with the help of social sciences faculty. (However, a template could be designed for different habitations, rural/urban.
- The Governmental agencies, like revenue administration, corporation and municipal authorities and village secretariats could be aligned for the survey.

2. Community Awareness Campaigns (One Week)

• Based on the survey and the specific requirements of the habitation, different awareness campaigns and programmes are to be conducted, spread over two weeks. The list of activities suggested could be taken into consideration.

3. Community Immersion Programme (Three Weeks)

Along with the Community Awareness Programmes, the student batch can also work with any one of the below listed governmental agencies and work in tandem with them. This community involvement programme will involve the students in exposing themselves to experiential learning about the community and its dynamics. Programmes could be in consonance with the Govt. Departments.

4. Community Exit Report (One Week)

• During the last week of the Community Service Project, a detailed report of the outcome of the 8 weeks of work is to be drafted and a copy shall be submitted to the local administration.

This report will be a basis for the next batch of students visiting that particular habitation. The same report submitted to the teacher-mentor will be evaluated by the mentor and suitable marks are awarded for onward submission to the University.

• Throughout the Community Service Project, a daily logbook needs to be maintained by the students batch, which should be countersigned by the governmental agency representative and the teacher-mentor, who is required to periodically visit the students and guide them.

SIXTH SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6S1	Architectural Design – V	1	9	0	10	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	This course is intended to provide skills for functional activities related to public spaces	1,2,3,4, 5,6,7,8, 9,10,12	5,6
CO2	To develop abilities in design w.r.t to environment and microclimate	1,2,3,4, 5,6,7,8, 9,10,12	6
CO3	Understanding the integration of functional aspects of public zones	1,2,3,4, 5,6,7,8, 9,10,12	6
CO4	To understand the application of the Socio-economic profile of the user group.	1,2,3,4, 5,6,7,8, 9,10,12	6
CO5	To understand the NBC and other relevant codes	1,2,3,4, 5,6,7,8, 9,10,12	6
CO6	To the Relevant design considerations for barrier-free design	1,2,3,4, 5,6,7,8, 9,10,12	6

COURSE CONTENT

Design issues should address the following:

- Environmental and microclimate.
- User behaviour and requirements.
- Utility and space enhancement.
- Form and function.
- Circulation: horizontal and vertical.
- Site Planning and Landscape detailing.
- Structural details such as beam framing, Building Services / HVAC, etc.
- Socio-economic profile of user group.
- Parking details and standards.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.

DESIGN TASKS

Design problems on the design of a closed environment, with emphasis on the articulation of interior spaces, detailing and finishing materials, textures, colour and light, acoustics and air-conditioning.

Exterior spaces formed by buildings, Elevations, fenestration and built form as a moderator of urban space, site planning and landscaping.

The problems may be set in the context studied in ADs 5. Working drawings related to one or more aspects studied above with a view to understanding structure and services related to buildings of 3 to 5 storeys and the implications of specifications on the quality and cost of the final architectural product.

This course shall be integrated with the building Construction studio. This may be group efforts in a simulated Real-time situation.

Suggestive Typologies/ projects:
Emphasis on the design of services-intensive, multi-storeyed, buildings in a tight urban spatial context, such as buildings for health care, hospitality, institutional or multifunctional commercial usage, Museum/ Art centre, R & D centre etc,

REFERENCE BOOKS

1. Chiara Joseph de and others. Time Savers Standards of Building Types. McGraw – Hill, 1980.
2. Dawes, John. Design and Planning for Swimming Pools. The Architectural Press, London, 1979.
3. Ruknitein, M. Harvey. Central City Malls.
4. Time savers standards of Building Types-Joseph de chiara & others.
5. A History of Building Types-Nikolays Pevsner.
6. Architect's Data-Ernst Neufert.
7. Architect's Hand book-Charanjit. Shah.
8. National Building code

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6S2	Working Drawings and Details	1	3	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the scale of drawings and preparation of working drawings of floor plans	1,3,5,6, 9,10	5
CO2	To study the preparation of working drawings of elevations & sections	1,3,5,6, 9,10	5
CO3	To study the preparation of electrical layouts, stairs	1,3,5,6, 9,10	5
CO4	To study the preparation of architectural elements detailing	1,3,5,6, 9,10	5
CO5	To understand the detailing of openings of doors and windows	1,3,5,6, 9,10	5
CO6	To understand the detailing of barrier-free environment details.	1,3,5,6, 9,10	5

MODULE – I

PREPARATION OF WORKING DRAWINGS: Suitable scales of drawings, and methods of giving dimensions: on plans, sections, elevations, and other standards.
Preparation of Plans Building marking plan, excavation plan, centreline plan, foundation plan, column centrelines drawings, floor plans, terrace floor plan.

MODULE – II

ELEVATION AND SECTIONS
Detailed elevations, detailed sections – at least one through vertical transport i.e staircase/elevator etc. toilet, typical wall profile sections, and elevations.

MODULE – III

Layout For Sanitation and detailed plans, Electrical layout: plans and details, details of staircases, toilets, and kitchens. Detailing for walls, floors, and ceilings through detailed drawings to large scale in the form of plans, sections, and elevations. Surface Treatment; Cladding, texture treatment

MODULE – IV

Detailing of architectural elements such as staircase, balcony, and verandah, shading devices vertical and horizontal components of the building.

MODULE – V

Detailing of Doors, windows, storage shelves for frames, shutters, joinery of the frame to shutter, shutter to panelling, etc., and other fixing details in different materials

MODULE – VI

Design details appropriate for creating a Barrier-Free Environment.

Note:

Students shall prepare at least two working drawing sets, one for a small residence and one for a large building. (Load Bearing and R.C.C. framed structure with part/basement, ground floor and first floor with lift/elevator including interior detail drawings)

REFERENCE BOOKS

1. Lerrs, Jack. Engineering Construction Specification.
2. Liebing, W. Ralph, and Raul, Ford Mimi. Architectural Working Drawings, 2nd ed. John Wiley and Sons, New York, 1983.
3. Macey, W. Frank. The specification in Detail, 5th ed. Technical Press Ltd, London, 1955.
4. Shah, M.G., and Others. Building Drawing: with an integrated approach to building environment, 3rd ed. Tata McGraw Hill Pub., co. Ltd, New Delhi, 1996.
5. Standard Specification of Government of Andhra Pradesh State.
6. Lewis, R. Jack. Building Construction Specifications. Prentice-Hall, Inc., New Jersey, 1975.
7. Govt. of Maharashtra. Standard Specifications, Government Press, Nagpur, 1972.
8. Datta, B.N. Estimating and Costing in Civil Engineering: Theory and Practice, 23rd ed. UBS Pub. New Delhi, 1993.
9. Wakita, Osamu A. & Linde, Richard M. The professional practice of architectural detailing, 2nd ed. New York: Wiley, 1987.
10. Robert, C. Mc Hugh. Working Drawing Hand Book, New York: VNR, 1977

Professional Core Subjects

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6C1	Building Specifications Estimation, and Costing	2	0	1	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the data required and methods of estimation	1,4,5,8,9, 10,11	2
CO2	Ability to estimate various quantities using different methods	1,4,5,8,9, 10,11	2
CO3	To understand the estimation and costing of various building elements.	1,4,5,8,9, 10,11	2
CO4	To prepare the estimates for different natures of works.	1,4,5,8,9, 10,11	2
CO5	To understand the rate analysis.	1,4,5,8,9, 10,11	2
CO6	To understand how to write the specifications for different materials and prepare an estimation for a small project.	1,4,5,8,9, 10,11	2

MODULE – I

QUANTITY SURVEYING: Introduction - Definitions and terms used, principles, units of measurements. Methods of preparing approximate/preliminary estimates (plinth area and cubic content method), basic differences and advantages.

MODULE – II

DETAILED ESTIMATE: data required, factors to be considered, methodology of preparation, abstract of the estimate, contingencies, work-charged establishment, bill of quantities, different methods for estimating building works, Method of obtaining detailed quantities of building items (center line method, long wall and short wall method) PWD System to be followed.

MODULE – III

Detailed estimation for load-bearing structure in brick masonry and framed structure (ground floor only) Example and exercise in obtaining all items from excavation to finishes including arches, steps, polygonal, circular rooms, measurement of RCC work in slabs, columns, beams, staircase etc.

MODULE – IV

Preparing approximate estimates for services like water supply, plumbing, sanitation, electrical work, mechanical equipment and air conditioning. (For residential buildings).

Simple earthwork calculations for road work – mid-sectional area, mean area, prismoid formula methods (no transverse slope)

MODULE – V

RATE ANALYSIS: definition; method of preparation; quantity and labour estimate for unit work; Cost of materials and labour for various works, data sheet for different items of works, different methods of execution i.e. piece work, daily basis, lump sum, labour rates and percentage etc; a task or outturn work; rate analysis for earthwork, concrete works, first class brickwork, reinforced brickwork, cement plastering, DPC with cement mortar/ concrete, finishing (cement paint, distemper, acrylic emulsion, enamel paint) to walls & ceiling.

MODULE – VI

SPECIFICATIONS: Definition, purpose and importance of specifications, General or brief specifications, Detailed specifications, writing of specifications for the purpose of calling for tender types of specifications, general specifications for 1st, 2nd, 3rd and 4th class buildings Specifications

Specification, writing to include materials, tests pre and post-installation, and modes of measurements. Estimation using Excel, A capstone project t on the same need to be done. CPWD specifications and manuals (Govt. of Maharashtra)

TEXTBOOKS

1. S.C. Rangwala, “Estimating, Costing and Valuation (Professional Practice)”, 1984.
2. B.W. Dutta, “Estimating & Costing” (Revised by S. Dutta), UBS Publishers Distribution P.Ltd. India, 1983.
3. M. Chakraborti, “Estimating Costing and Specification”, 1984
4. Gurcharan Singh & Jagdish Singh, “Estimating Costing and Valuation”, Standard Publishers Distributors, 2012.

REFERENCE BOOKS

1. Govt. of Maharashtra. Standard Specifications, Government Press, Nagpur, 1972.
2. Standard Specification and rates, Government of Andhra Pradesh, Government Press, Vijayawada.
3. Indian Standards Institution. National Building Code of India 1983. Indian Standards Institution, New Delhi, 1984.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6C2	Housing	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the evolution of housing	1,2,3,4, 6,7,9	2
CO2	To understand the Housing situation in India	1,4,5,8, 9,10,11	2
CO3	To understand Housing standards both in rural & urban	1,4,5,8, 9,10,11	2
CO4	To understand Housing strategies, alternative technologies	1,4,5,8, 9,10,11	2
CO5	To understand Housing layout & design	1,4,5,8, 9,10,11	2
CO6	To understand the Housing process and financing	1,4,5,8, 9,10,11	2

MODULE – I

EVOLUTION OF HOUSING:

A brief review of the historical development of housing in various contexts, and its evolution based on social aspects.

MODULE – II

HOUSING SITUATION IN INDIA

Housing need and Demand: Housing and Habitat policy and perspective at the national level. Problems and Issues in urban & Rural Housing, Housing Agencies and their role in housing development.

MODULE – III

HOUSING STANDARDS

Issues involved in formulating housing standards for rural and urban areas, desirable and minimum standards. Residential Densities

MODULE – IV

HOUSING STRATEGIES

Review of different forms of housing globally – particularly concerning the third world countries.

Brief acquaintance with some strategies such as sites and services upgrading existing shelters, stimulating private-sector production, developing building materials and alternative technologies, improving the architectural design., protecting inner-city renters, land sharing, resettlement, etc.

MODULE – V

HOUSING LAYOUTS AND DESIGN

The traditional pattern of housing design, Row Housing, Cluster Housing Apartment housing, low-rise versus high-rise housing, Incremental housing, and neighbourhood unit. Case studies of housing Projects

MODULE – VI

HOUSING PROCESS

Managing and financing housing projects. People's participation, development control rules, and environmental aspects

REFERENCE BOOKS

1. Alexander, Christopher. Pattern language: Towns, Buildings, Construction. Oxford University Press, New York.
2. Chiara, De Joseph and Others. Timesaver's standard for Housing and Residential Development, 2nd ed. McGraw Hill, Inc, New York.
3. Desai, A.R. and Pillai, Devadas. Slums and Urbanization, Popular Prakashan Pvt. Ltd.
4. HUDCO. Housing for the Low Income. HUDCO.
5. Poulose, K. Thomas. Reading Material on Housing. Institute of Town Planners, New Delhi.
6. Cedric Prgh (1990) Housing and Urbanisation, Sage Publication New Delhi

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6C3	Advanced Construction Technology and Structural Systems	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	The students should be able to Understand the basic concepts of pile foundations.	1,2,3,7,8	1, 2
CO2	Ability to understand the recent developments in concrete technology	1,2,3,7,8	1, 2
CO3	Familiar with the advanced construction techniques in concrete (pre stressed concrete and post tensioning systems)	1,2,3,7,8	1, 2
CO4	Understand the concepts and classification of cable, shells, and folded structures	1,2,3,7,8	1, 2
CO5	Ability to Understand the basic concept of high rise buildings	1,2,3,7,8	1, 2
CO6	Gain the knowledge on construction techniques and structural forms available for adopting to architectural forms. Understand the concepts and classification of cable, shells, and folded structures	1,2,3,7,8	1, 2

MODULE – I

PILE FOUNDATIONS: Introduction, uses, selection of pile, types of piles, pile spacing, group of piles, efficiency of group of piles, pile cap and pile shoe, load tests on piles, pile driving, pulling of piles, loads on piles, causes of failures of piles, pile driving formulas, Construction techniques.

MODULE – II

ADVANCED CONCRETE TECHNOLOGY: Introduction-construction methodology of pre-stressed concrete beams slabs frames, lift slab construction post tensioning, multi-storied building frames, and beams.

Uses of rapid-hardening cement, ready mix concrete (RMC), light weight concrete surface finishes of cement. Under water structures, diaphragm wall structures.

MODULE – III

ADVANCED CONSTRUCTION TECHNIQUES: Introduction-Concept of Modern construction techniques- merits and demerits of Twin wall technology- precast flat panel system, precast cladding panels, Precast flat panel modules, Concrete 3D printing technology, precast foundation technique, Hybrid Concrete building technique, insulating concrete formwork (ICF) technique.

Pre-Stressed Concrete Introduction to pre-stressed concrete – pre-stressed concrete materials – Methods of pre-stressing - Comparison between RCC and prestressed concrete. Introduction to Post Tensioning systems and their applications.

MODULE – IV

STRUCTURAL SYTEMS: Introduction, geometry of Space frames: Folded plates, shells, cyclonical shells, Hyperbolic paraboloids, Braced structures free forms and its applications

MODULE – V

HIGH RISE BUILDINGS: Definition of High rise in different contexts-need-scope-advantages and disadvantages-History of high rise structures-5 ages of high rise structures.

Tall buildings structural systems – Rigid frames – Braced frames – Shear wall –Base Isolation – Wall frame buildings – Tubular buildings – Tube-in tube buildings – Outrigger braced system – Brief outline of their behaviour and their applicability for various heights of buildings.

MODULE – VI

SPECIAL STRUCTURES: Definitions, Types – single, double & multi-layered grids – two ways & three-way space grids, connectors,– Introduction to Domes - various forms – Geodesic domes, suspended cable structures – types of cable network systems, shapes of cable suspended systems, examples of tensile membrane structures – types of pneumatic structures.

CABLE STRUCTURES: Introduction, Need, geometry, applications of Simply curved suspended roofs, membrane structures, cable structures, combination of cables and struts.

TEXTBOOKS

1. Sinha. N.C and Roy. S. K, Fundamentals of Reinforced Concrete, S.Chand& Co. Ltd., New Delhi.
2. Soil mechanics and foundation engineering by Dr. K.R Arora, standard publisher, dist.
3. Concrete technology theory and practice by M.S Shetty, Revised edition, S. Chand publications
4. Concrete technology theory and practice by A r Santha kumar,oxford publications.
5. Designing Tall Buildings: Structure as Architecture By Mark Sarkisian
6. Ramamrutham. S and Narayanan. R, Reinforced Concrete Structures, Dhanpat Rai Publications, New Delhi, 1997
7. Bryan Stafford and Alex Coull, Tall Building Structures, Analysis and Design John Wiley & Sons, NewYork, 1991.

REFERENCE BOOKS

1. Bandyopadhyay. J.N, Thin Shell Structures Classical and Modern Analysis, New Age International Publishers, New Delhi, 1998
2. Ramaswamy. G.S, Design of Construction of Concrete Shell Roofs, McGraw Hill Publishing Company, New York, 1986
3. Krishna Raju. N, Pre-Stressed Concrete, Tata McGraw Hill Publishing Company Ltd., New Delhi
4. Taranath. B.S, Structural Analysis and Design of Tall Buildings, McGraw Hill, New York, 1988.
5. Purushothaman. P, Reinforced Concrete Structural Elements, Tata McGraw Hill Publishing Co Ltd.,

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6C4	Architectural Acoustics and Lighting	2	0	0	2	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand how sound is generated and propagated as a principle for architectural acoustic design.	1,2,3,7, 8,10	2
CO2	To study room Acoustics	1,2,3,7, 8,10	2
CO3	To study the Acoustic design process and requirements of different types of buildings	1,2,3,7, 8,10	2
CO4	To understand the Specific lighting design requirements of different buildings	1,2,3,7, 8,10	2,3
CO5	To understand the behaviour of daylighting in interior spaces	1,2,3,7, 8,10	2,3
CO6	To understand the Integration of daylighting with artificial lighting and the Conservation of energy in lighting use of daylight	1,2,3,7, 8,10	2,3

MODULE – I

ACOUSTICS

Need to study acoustics, pioneers, and their works. Acoustics examples from the past: methods used for good acoustics. Definitions, terms related to acoustics.

Theory of sound

Generation, propagation, transmission, reception of sound, sound waves, frequency, intensity, wavelength, sound pressure, measurement of sound, scales- decibel scale.

Characteristics of speech**:** Characteristics of speech, music and hearing- distribution of energy in speech and Music frequencies, the intelligibility of speech, and high fidelity reproduction of music. Human ear characteristics- making of sound, Binomial hearing, behaviour of sound in enclosed spaces.

MODULE – II

ROOM ACOUSTICS

The behaviour of sound in enclosed spaces. Resonance, reverberation, echo, reverberation time, simple exercise using Sabine's formula. Ray diagrams, sound paths, the effect of geometry and shapes, sound adsorption, sound absorption coefficients, Sound insulation, materials, and resonant panels.

MODULE – III

ACOUSTIC DESIGN

Acoustic design process and requirements of different types of buildings: Auditoriums, concert halls, cinema halls, Seminar rooms, lecture halls, classrooms, and open offices.

Case study of an auditorium with a report containing drawings and calculations of reverberation time etc. Detailed acoustic design for any one type of building.

MODULE – IV

LIGHTING

Light and vision, quality and quantity of light of different sources of light. Daylight, incandescent lamps, halogen lamps, electric gas discharge lamps, fluorescent lamps, high discharge lamps, market survey

Specific lighting design requirements of different buildings such as homes, offices, industrial, hospitals, art galleries, museums, and exhibitions, a case study of at least one type of the building by students.

MODULE – V

DAYLIGHT AND OUTDOOR LIGHTING

Daylighting, advantages of daylighting; design tools in daylighting and examples, the behaviour of daylighting in an interior space. Potentials of daylighting as an energy resource

Outdoor lighting: road lighting, high-mast lighting, tunnel lighting, landscape lighting, decorative lighting, facade lighting, spot lighting

MODULE – VI

INTEGRATION OF DAYLIGHTING WITH ARTIFICIAL LIGHTING

Lighting controls and intelligent building systems for lighting. Conservation of energy in lighting use of daylight, optical fibre lighting, LED in lighting, and the emerging trends in lighting.

REFERENCE BOOKS

1. Poella. L. Lestie. Environmental Acoustics.
2. Moore, J.E. Design of Good Acoustics, The Architectural Press, London, 1961.
3. Burris, Harlod. Acoustics for the Architect.
4. Lord, Peter, and Templetion, Duncan. The Architecture of Sound: Designing Places of Assembly. Architectural Press Ltd., London, 1986.
5. Egan, David. Architectural Acoustics, MC Graw-Hill Book Company, New York,1988
6. Moore, Fuller. Concepts and practice of Architectural Day Lighting. Van Nostrand Reinhold co., New York, 1985.
7. Valia, Anil. Designing with light: A Lighting H.B. International Lightning Academy, Mumbai, 2002, Architectural Physics: Lighting.
8. Hopkinson R.G, Her Majestrip stationery office, London.
9. David Egan. M, concepts in Architectural Lighting Mc Grew Hill Book Company, New York, 1983

Professional Electives – II

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6E1	Green Buildings	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the components of green buildings and their features	1,3,4,5, 7,10	2
CO2	To understand components of passive heat and cool techniques at the building level	1,3,4,5, 7,10	2,3
CO3	To understand the concept of recycling and conservation at a community level	1,3,4,5, 7,10	2,3
CO4	To study existing case studies of green buildings	1,3,4,5, 7,10	3
CO5	To study sustainable components and their features, design procedure and methods	1,3,4,5, 7,10	2
CO6	To study sustainable buildings (case study)	1,3,4,5, 7,10	2,3

MODULE - I

BIOCLIMATIC DESIGN CONCEPTS

Green buildings- salient features- Introduction to GRIHA, LEED & IGBC rating system – Concept of Sustainable sites –Orientation to sun and Wind -Landform & orientation - Vegetation & Pattern, Water Bodies etc.

MODULE - II

PASSIVE AND ACTIVE HEATING TECHNIQUES

Passive Heating techniques: General principles – Direct gain systems - Glazed walls, Bay windows, etc. Indirect gain systems – Trombe wall, Water wall, Solar Chimney etc. Isolated gain systems – Natural convective loop etc. Active Heating Systems: Solar water heating systems.

PASSIVE AND ACTIVE COOLING CONCEPTS

Passive Cooling techniques: General principles – Evaporative cooling, Nocturnal radiation cooling, Passive Desiccant cooling, induced ventilation, earth sheltering, Berming, Wind Towers, earth – Air tunnels, Curved Roofs & Air Vents, Insulation, etc. Active Cooling techniques: Air coolers.

MODULE - III

REDUCE, RECYCLE AND REUSE

Water conservation by Rainwater Harvesting systems – Treatment of wastewater: Physical, Chemical and Biological methods.

Use of Environment-friendly materials, Biodegradable materials. Recycling and Reuse of steel, Aluminum and Glass.

MODULE - IV

INNOVATIVE GREEN TECHNOLOGIES AND CASE STUDIES

Innovative uses of solar energy: BIPV, Solar Forest, Solar powered street elements, - Innovative materials:

Phase-changing materials, Light sensitive glass, Self-cleansing glass.
Case studies on green buildings: CII building, Hyderabad, Gurgaon Development Centre-Wipro Ltd etc.

MODULE - V

SUSTAINABLE DESIGN METHODS & MATERIAL OPTIMIZATION

Sustainable design strategies and approaches, Sustainable design innovation, Systems design, Trans-disciplinary collaboration in design, Life cycle design and life cycle assessment (LCA),

Design for disassembly, Design for reuse, Design for sustainable manufacturing and construction, Design for remanufacturing.

MODULE - VI

CASE STUDIES OF SUSTAINABLE BUILDINGS

Study the architectural design of the following buildings in order to explore the use of green building materials, energy and water conservation, and creating safe, healthy indoor environments Indian: Gurgaon Development Centre- Suzlon one earth etc.

TEXTBOOKS

1. Sustainable design manual, Vols 1& 2, The energy and resource institute, New Delhi.

REFERENCE BOOKS

1. Arvind Krishnan & Others – Climate Responsive Architecture, Tata Mcgraw –Hill New Delhi 2001.
2. Ralph M . Lebens – Passive Solar Architecture in Europe – 2, Architecture Press, London 1983.
3. Sandra Mendler, William Odell, The Guide Book Of Sustainable Design, John Wiley & Sons, 2000.
4. Lawson. B, Building Materials, Energy And The Environment; Towards Ecologically Sustainable Development Raia, Act, 1996
5. Charles. J. Kibert, 'Sustainable Construction' John Wiley and sons Inc, USA.
6. N.D. Kaushika, Energy, Ecology and Environment, Capital Publishing Company, New Delhi.
7. John Fernandez, Material Architecture, Architectural Press, UK.
8. Rodney Howes, Infrastructure for the built environment, Butterworth Heineman.
9. G.Tyler Miller JR, Living in the Environment, Wardsworth Publishing Company, USA

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6E2	Interior Design	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the role of Interior designer and the scope of services	1,3,4,6, 7,10	2
CO2	To understand the Interior Space planning, human dimensions, and Business perspectives of Interior design.	1,3,4,6, 7,10	2
CO3	To study the fundamentals of Interior Design	1,3,4,6, 7,10	2
CO4	To understand the usage of Colours in interiors	1,3,4,6, 7,10	2
CO5	To understand the historical perspective of furniture and styles	1,3,4,6, 7,10	3
CO6	To understand the lighting of interiors	1,3,4,6, 7,10	2

MODULE - I

THE PROFESSION OF INTERIOR DESIGN: Role of an Interior Designer- past and present; Scope of services; Interior Design Process. Interior Design and Concepts: Elements and Principles of design- an overview and their applications in interior designing.

MODULE - II

BUSINESS PERSPECTIVES OF INTERIOR DESIGN: an overview of the practice of interior design in India. Interior Space planning and human dimensions. Focuses on physical, psychological Behavioural, and human factors, the study of Proxemics, Behavioural settings.

MODULE - III

Introduction to the fundamentals of Interior Design such as Lighting, Furniture, Space, Materials, Furnishings, Art, etc. Appreciation of various arts; painting, murals sculpture, architecture etc. Interior Design in the context of other arts.

MODULE - IV

COLOURS IN INTERIORS – Colour Theory, the Effect of light on colour, various colour schemes like analogues, complementary, triadic, etc. Colour symbolism. Psychology of colour, Industrial colour codes. International standards.

Design-related cognitive learning. Colour theory & application to the interior environment, principal colour systems, and methods of colour harmony.

MODULE - V
INTRODUCTION TO FURNITURE AND ACCESSORIES: An overview of the historical perspective of furniture and styles, accent pieces, and accessories from the Egyptian period to the present. Basic Furniture vocabulary. Styles of Interiors – Italian, English, French, Japanese styles, etc.
MODULE - VI
INTERIOR LIGHTING: Direct and indirect lighting, location and light grid systems, types of luminaries, quality of lighting. The ambient, task, and accent lighting. Exposure to eminent interior designers' works- Indian and international
REFERENCE BOOKS

1. Archi World. Interior Best Collection: Residence, Commerce, Office, Restaurant Asia I-IV. Archi World Co., Korea, 2003.
2. Friedmann, Arnold, and Others. Interior Design: An Int. to Architectural Interiors. Elsevier, New York, 1979.
3. Miller, E. William. Basic Drafting for Interior Designers. Van Nostrand Reinhold, New York, 1981.
4. Kurtich, John and Eakin, Garret. Interior Architecture, Van Nostrand Reinhold, New York, 1993.
5. Rao, M. Pratap. Interior Design: Principles and Practice, 3rd ed. Standard Pub.,2004.

Open Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VI	AR21B6O1	Digital skills for Design	2	0	0	2	100	0	100

COs	Course Outcomes	POs	BTLs
CO1	To gain knowledge on Interface & basic tools	5,8,9,10	2
CO2	To understand the usage of Illustration tools and techniques	5,8,9,10	2
CO3	To understand the usage of colouring, gradient & blending tools	5,8,9,10	2
CO4	To understand distort effects in Illustrator	5,8,9,10	3
CO5	To understand the usage of text Illustration	5,8,9,10	3
CO6	To create design templates for presentations	5,8,9,10	3

MODULE – I

INTRODUCTION TO PRESENTATION INTERFACE: Introducing various presentational interfaces like Illustrator, etc. creating a design template like logo/ poster/ etc. -Introducing Concepts, Layout, and Setup, Simple Shapes, Complex Shapes using pen/ geometric tools etc.

MODULE – II

CREATING AN ILLUSTRATION: Editing design template with the help of Display grids & guides, applying the zoom tool, aligning objects, formatting a line, adding text, and rotating an object.

MODULE – III

COLOURING & BLENDING: Duplicating an image, Fill & stroke effects, using color/ swatches/ gradients fills, applying blending modes..etc.

MODULE – IV

DISTORT EFFECTS: Adding Distort effects in the design: Distort an image, add a drop shadow, wrap text etc.

MODULE – V

TEXT ILLUSTRATION: Creating text illustration, adding shape to an area. The text outlines, create a text path and gradient, applying envelope distortion with reference to the design template.

MODULE – VI

CREATING A PROJECT: printing/ exporting, saving the file format, importing from other formats.

Poster design, sheet presentations, Poster presentations, logo designs, Cover page, icons, etc.

REFERENCE BOOKS

1. Adobe Illustrator for beginners 2021: learn graphic design with illustrator **by Hector Grant**
2. Adobe Illustrator Classroom in a Book by Brian Wood.
3. Adobe Illustrator: A Complete Course and Compendium of Features Paperback –by Jason Hoppe (Author)
4. Learn Adobe Illustrator CC for Graphic Design and Illustration: Adobe Certified Associate Exam Preparation

SEVENTH SEMESTER

Design Studios

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7S1	Architectural Design – VI	1	11	0	12	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To provide skills for functional activities related to Housing design	1,2,3,4,5, 6,7,8,9, 10,11,12	5,6
CO2	To develop the identity of space, public and private scales of space	1,2,3,4,5, 6,7,8,9, 10,11,12	6
CO3	To understand the appropriate technology and costs	1,2,3,4,5, 6,7,8,9, 10,11,12	6
CO4	To understand the application of the Socio-economic profile of the user group.	1,2,3,4,5, 6,7,8,9, 10,11,12	6
CO5	To understand the NBC and other relevant codes	1,2,3,4,5, 6,7,8,9, 10,11,12	6
CO6	To understand the Indian / local architectural responses to climate and other factors	1,2,3,4,5, 6,7,8,9, 10,11,12	6

COURSE CONTENT

Design issues should address the following:

- Density, mixed land use, ground coverage, development controls.
- Urban systems, services, and their integration with the project.
- User requirements (derived from surveys)
- Issues in appropriate technology and costs.
- Issues of hierarchy, the identity of space, public and private scales of space. Integration of community institutions etc.
- Detailing for the disabled and the elderly.
- Indian / local architectural responses to climate, culture, traditional values, building elements, symbols motifs, and special character.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.
- Design exercise related to housing design for specific target groups

- The issue in preparation of a Master Plan
- Environmental considerations.
- Phases of development.
- Scope for expansion for future developments
- Safe and comfortable vehicular and pedestrian movement.
- Issues of character and landscaping.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled

DESIGN TASKS

The brief would be as per the area of study as suggested above. Exg. Housing: Design problems involving high-density, large-scale housing, Socioeconomic determinants, Legislative and economic constraints and technological alternatives shall be studied in detail. Exercises in simulation and conceptual modelling shall be conducted. Application of concepts of community participation, phasing, financing and construction planning.

Project documentation including basic working drawings, preliminary estimates, outline specifications and scheduling aimed at a comprehensive understanding of the implementation process.

Suggestive Typologies/ projects:

Low-rise high-density housing and high-rise high-density housing. Also, housing and facilities for other user groups - old age Homes, orphanages, working women's hostels, homes for the physically and mentally challenged While designing socio-economic determinants, regulatory and technological alternatives shall be studied in detail. Exercises in simulation and conceptual modelling shall be conducted.

REFERENCE BOOKS

1. Alexander, Christopher. Pattern language: Towns, Buildings, Construction. Oxford University Press, New York.
2. Richard. D. Dober. Campus Architecture: Building in the Groves of Academy. McGraw Hill, New York, 1996.
3. Chiara, De Joseph and Others. Timesavers standard for Housing and Residential Development, 2nd ed. McGraw Hill, Inc, New York.
4. Newman, Oscar, and Others. Defensible space: People and Design in the Violent City. Architectural Press, London, 1972.

Professional Core Subjects

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7C1	Advanced Building services	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To familiarize with different air conditioning systems, their context of use and the basics of planning involved.	1,3,5,6, 7,9,10	2,3
CO2	To understand the design criteria for the selection of air conditioning	1,3,5,6, 7,9,10	2,3
CO3	To understand fire safety, firefighting, fire prevention and installations in buildings.	1,3,5,6, 7,9,10	2,3
CO4	To understand the mechanical transportation systems in a building and their design requirements.	1,3,5,6, 7,9,10	2,3
CO5	To integrate services in buildings.	1,3,5,6, 7,9,10	2,3
CO6	To understand the concept and application of Automation Systems	1,3,5,6, 7,9,10	2,3

MODULE - I

AIR CONDITIONING –PRINCIPLES, SYSTEMS AND DESIGN CRITERIA

Thermodynamics. Transfer of heat. Refrigeration cycle components. Vapour compression cycle. Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, cooling towers.

Air conditioning systems for buildings of different scales and their requirements- window type, split system, package unit, direct expansion system, chilled water system, fan coil unit and district cooling systems. Energy efficient systems, environmental aspects, and latest innovations.

MODULE - II

Design criteria for selection of air conditioning. Configuring/ sizing of mechanical equipment, equipment, and spaces for them. Horizontal and vertical distribution of services for large buildings. Exercise on the above through choice, calculations, layout, drawings

MODULE - III

FIRE AND SAFETY

Causes of fire in buildings. Stages of fire and how it spreads. Fire drill. Heat/ fire/ smoke detection. Alarm and extinguisher systems. Fire safety standards. General guidelines for egress design for multi-storey buildings. Understanding all the above through product literature/ field visits. Exercise on the design of fire safety systems for different building types through choice, calculations, layout and drawings

MODULE - IV

MECHANICAL TRANSPORTATION SYSTEMS IN BUILDINGS

Lifts and escalators - types and applications. Round trip time for lifts. Design of lift lobby and vertical transportation core. Conveyors, travelators, dumb waiters. Standards for all. Latest technologies in vertical transport systems. Integration of lifts and escalators with building automation systems. Understanding all the above through product literature/ field visits.

Design exercise on the above through choice, calculations, layout, and drawings

MODULE - V

INTEGRATION OF SERVICES INTO ARCHITECTURAL DESIGN

Principles of grouping and integrating horizontal and vertical distribution of all services in a multi-storeyed building/ large building. Services to include vertical transportation, electrical, communication, air conditioning and fire safety. Integrating service requirements into architectural design in an appropriate typology involving a simple scale project through sketches/ drawings

MODULE - VI

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, firefighting, Communication etc. Current trends 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. William H. Severns and Julian R Fellows, 'Air conditioning and Refrigeration', John Wiley and Sons, London, 1988.
2. National Building Code -Bureau of Indian Standards.
3. 'ISHRAE Handbook for Refrigeration', 2015.
4. George R. Strakosch (Editor), Robert S. Caporale, 'The Vertical Transportation Handbook' 4th Edition, Wiley and Sons, 2010.
5. David Lee Smith, 'Environmental Issues for Architecture', Wiley, 2011. David Lee Smith, 'Environmental Issues for Architecture', Wiley, 2011.
6. National Building Code -Bureau of Indian Standards.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7C2	Urban Design	4	0	0	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the importance of Architecture w.r.t the Urban Design	1,2,3,6,7, 8,9,10	2
CO2	To understand the history of towns and cities	1,2,3,6,7, 8,9,10	2
CO3	To study the Modern movements in city development	1,2,3,6,7, 8,9,10	2
CO4	To understand the importance of planning agencies such as development authorities, etc in Urban Design	1,2,3,6,7, 8,9,10	2
CO5	To study the elements of urban spaces and the usage of landscape in urban design.	1,2,3,6,7, 8,9,10	2
CO6	To study the past and present trends in urban conservation	1,2,3,6,7, 8,9,10	2

MODULE - I

Discussion on Architecture, Urban Design and Town Planning Interface. Urban Morphology and Elements of Urban Design. Nature of urban design projects in public and private developments.

MODULE - II

Classical cities, medieval towns, neoclassic cities, and industrial towns. Characteristics of towns built by Hindu and Muslim rulers in India. Colonial inheritance, growth of post towns, civil lines, cantonments, railway and resort towns, and Design in New Delhi.

MODULE - III

Modern movements in city design such as ‘city-beautiful’ and ‘Garden city’ movements, utopian model Towns in the west. Changing the structure of cities: sectors, blocks, streets, squares, buildings, and open spaces.

MODULE - IV

Role of planning agencies such as development authorities and Urban Arts Commission in the design of cities. Influence of city development policies namely Master plans and zoning regulations on Urban Design. Built form and space requirement in residential, commercial industrial, and recreational land uses activities. Patterns of subdivision and land development. Methods of subdivision and land development.

MODULE - V

Elements of urban spaces: squares and streets. Use of landscape in urban design, such as tree avenues, street fencing, sidewalks, etc. figure-ground analysis
Lighting and illumination of cities, methods of lighting, signage, and elements of utility services in the city.

MODULE - VI
Urban conservation and its role in urban design. Past and present trends in urban conservation. Role of architectural control in urban conservation and city character and style.

REFERENCE BOOKS
1. Bacon, N. Edmund. Design of Cities. Penguin Books, New York, 1976. 2. Benevolo, Leonard. History of the City. 3. Krier, Rob. Urban Space, 3rd ed. Academy Editions, London, 1984. 4. Moughtin, Cliff, and Others. Urban Design: Ornament and Decoration. Butterworth- Heinemann, London, 1995. 5. Moughtin, Cliff. Urban Design Street and Square. 6. Mumford, Lewis. City in History: Its origin transformation and its prospects. 7. Sprelregen, Paul. Urban Design: The Architecture of Towns and Cities. 8. Lynch, Kwin, the Image of the city Cambridge mass: MIT press, 1965

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7C3	Environment Science for Architecture	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the Environmental aspects w.r.t the design	1,3,6, 7,8	2
CO2	To study and understand the complex relationships between the built and natural environments	1,3,6, 7,8	2
CO3	To understand Biomimicry - the study of natural structures	1,3,6, 7,8	2
CO4	To study the building envelope, orientation and components of building fabric and Shading	1,3,6, 7,8	2
CO5	To understand the concepts of urban ecology and landscape urbanism.	1,3,6, 7,8	2
CO6	To understand and develop the concept of green field development	1,3,6, 7,8	2

MODULE - I

INTRODUCTION TO MACRO ENVIRONMENT: Elements of climate, weather, Water cycle, Carbon cycle, Environmental quality, Deforestation, climatic change, Ozone depletion, and implications.

MICRO-ENVIRONMENT: Natural environment is a built environment. Living environment Characteristics and components of Urban Ecosystem solar radiation, heat flow, air-movement, Land use, drainage, and sanitation

MODULE - II

RELATIONSHIP BETWEEN BUILT AND NATURAL ENVIRONMENT

Complex relationships between the built and natural environments; Impact of pollution on natural and man-made environments.

MODULE - III

STRATEGIES TO TRANSFORM THE BUILT ENVIRONMENT TO MEET THE RISKS OF CLIMATE CHANGE

Biomimicry - the study of natural structures and processes- in helping to solve man-made problems and enabling design

MODULE - IV

BUILDING RESOURCES: Passive energy system design, Building envelope, orientation and components of building fabric and Shading, High rise buildings, modular building

MODULE - V

CONCEPTS OF URBAN ECOLOGY AND LANDSCAPE URBANISM

Case studies; integration of Renewable Energy Systems in the built environment.

MODULE - VI

CONCEPTS OF GREEN FIELD DEVELOPMENT

Brownfield development, environmental impact and ecological balance FAR, layouts, sustainable Site development, vegetation, landscape elements, alternative services and technologies, rainwater harvesting, on-site sewerage retention, treatment, recycling and reuse. Construction, curtain walls, Sourcing, and recycling of building materials, alternative Calcareous, metallic, and non-metallic, materials.

REFERENCE BOOKS

1. Manual of Tropical Housing and Building - Koenigsberger
2. Theoretical and vernacular related: A place in shade by charles correa
3. Green Building Technologies - Godrej Centre CII a Madhapur,
4. Hyderabad. Greening Building – Green Congress, US.(web). HSMI. Sustainable Building Technology – HUDCO,
5. HSMI (Human Settlement Management Institution, New Delhi. Koenigsberger, O.H. and Others. Manual of Tropical Housing and Building. Orient Longman, Chennai, 2003.
6. Odum, P. Eugene. Ecology and Environments, 2nd ed. Oxford and IBH Pub., New Delhi. TERI, The Building Energy Audit – TERI (Tata Energy Research Institute)

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7E1	Tall Buildings	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the design approach for the tall buildings	1,3,5,7, 8,10	2
CO2	To understand the importance of vertical transporting in tall buildings	1,3,5,7, 8,10	2,3
CO3	To study the fundamentals of fire safety and design for fire safety	1,3,5,7, 8,10	2
CO4	To study the calculation of Heating and Cooling loads	1,3,5,7, 8,10	2
CO5	To understand the Basic planning for water supply	1,3,5,7, 8,10	3
CO6	To understand the electrical layouts for tall buildings	1,3,5,7, 8,10	2,3

MODULE - I

DESIGN AND STRUCTURES

Design approaches for tall buildings; studying some famous examples as case studies; structural concepts of tall structures.

MODULE - II

VERTICAL TRANSPORTATION

Introduction to passenger elevator codes – Express & Local Elevators, Sky lobbies, etc., - Study of elevator equipment, control systems, and spatial requirements – Escalators and Capsule elevators – Stairways & Ramps

MODULE - III

FIRE PROTECTION

Designing for fire safety – NBC – Fire alarm systems – Smoke detectors – Firefighting support systems – Fire rating of materials - Fire escape stairs & Safety regulations – Lightning protection

MODULE - IV

THERMAL CONTROL SYSTEM

Calculation of Heating and Cooling loads – Selection of suitable HVAC system – Special equipment and systems for heating and cooling – Spatial requirements for HVAC plants – Design of duct layouts etc.

MODULE - V

WATER SUPPLY AND SEWAGE DISPOSAL

Basic planning for water supply – Calculation of capacity for sumps and water tanks -–Skip stage pumping,

etc., -Rainwater harvesting methods – Sanitation arrangements in high-rise structures – Service floors – Ducts and vertical shafts – Waste treatment, etc.

MODULE - VI

ELECTRICAL SYSTEMS

Planning transformer & generator rooms, Preparation of electrical layouts for tall buildings – Spatial requirements of electrical rooms and ducts – Intelligent systems for electrical and illumination.

REFERENCE BOOKS

1. Stein Reynolds Mc Guinness – Mechanical and Electrical equipment for buildings – vol 1 & 2 – John Wiley & sons
2. Francisco AsensioCerver – The architecture of Skyscrapers – Hearst Book International Bennetts Ian & others – Tall building structural systems Proceedings of the council for tall buildings

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7E2	Architectural Journalism and Photography	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand architectural photography and articles	1,3,5,6, 8,10	2,3
CO2	To develop writing skills, blogs, and books.	1,3,5,6, 8,10	2,3
CO3	To understand photo journalism, public relations	1,3,5,6, 8,10	2,3
CO4	To understand journalism, law legal boundaries	1,3,5,6, 8,10	2,3
CO5	To understand contemporary architectural journalism	1,3,5,6, 8,10	2,3
CO6	To develop an article based on research	1,3,5,6, 8,10	2,3

MODULE - I

INTRODUCTION OF PHOTOJOURNALISM

Definition of Photojournalism - Brief History - Photographs as social Documentaries - Birth of modern Photojournalism since the 1950s - visual awareness – visual survey - EDFAT methods in using the camera - Equipment required for Photo journalism.

MODULE - II

DEVELOPMENT OF WRITING SKILLS

Usage of language and Vocabulary and grammar introduction to the methodology of writing essays, news writing, precis writing, writing in architectural blogs; listening comprehension, analysing talks and information gathered and editing gathered information to build an article. The originality of the topic. Collecting clippings from articles, blogs, and books.

MODULE - III

PHOTOJOURNALISM IN PERSPECTIVE - Snapshots - Advanced amateur Photography - Art Photography - Photojournalism - Approach to Photojournalism – News Papers and Magazine Design elements: Page make -up - Layout - colour scheme - Font - Blurb - Pictures - Ads etc- Other magazines - Documenting of Places - Rural-Urban - Public relations.

MODULE - IV

PRODUCTION AND PRESENTATION – LEGAL BOUNDARIES: Key texts concerning architectural journalism and journalists; to critically contrast their outputs in terms of production, content, and/or presentation; to develop an ability to critically appraise selected individual pieces of journalism. Awards for

Architectural Journalism and some of the important recipients.
People journalism and law-legal boundaries-issues libel and invasions of privacy ethics- the photojournalist on scene.

MODULE - V

PRODUCTION OF CONTEMPORARY ARCHITECTURAL JOURNALISM-Building pictures - Instant, Report - Editing - Editorial thinking – the picture Editor - Editing practices, creating drama - Photo editing -Documentary-evolution of the word document-methods and techniques.

MODULE – VI

RESEARCH AND PRESENTATION: Assignments should include an article based on the ability to originate, plan, research, present, and produce a piece of architectural journalism. The techniques and processes used in the production should be identified by the student.

REFERENCE BOOKS

1. Kopelow, Gerry. How to photograph buildings and interiors, 3rd ed.New York:?Princeton Architectural Press, 2002.
2. De Mare, Eric Samuel. Architectural photography, London: Bats ford, 1975.
3. Busch, Akiko. The photography of architecture: twelve views, New York: Van Nostrand Reinhold Co., 1987.
4. Mehta, Ashvin. Happenings: journal of luminous moments, Vapi, Gujarat: Hindustan Inks, 2003.
5. Mohd, Al Asad. Architectural Criticism and Journalism
6. Sommer, Robert. Tom Wolfe on Modern Architecture

General Courses

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7G1	Personality Development	1	0	2	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the nature and theories of personalities	6,7,8,9, 10	2
CO2	To learn the importance of developing optimism and discipline	6,7,8,9, 10	2
CO3	To develop teamwork among the students	6,7,8,9, 10	2
CO4	To understand the importance of teamwork and managing the stress levels	6,7,8,9, 10	2
CO5	To improvise time management, Critical Thinking; Lateral Thinking (Situational); Leadership Qualities	6,7,8,9, 10	2
CO6	To understand the aspects of analytical thinking, problem-solving, etc.	6,7,8,9, 10	2

MODULE - I

PERSONALITY: Nature of personality; Theories of Personality- Type, Trait, Social Learning. Determinants of personality, Personality traits.

MODULE - II

ATTITUDE BUILDING

Importance of attitude, factors that determine our attitude, types of attitudes, building a positive attitude, developing optimism, and discipline.

MODULE - III

GROUP AND TEAMWORK

Group and Team dynamics, Group Structuring- Leadership, role, Tasks, effective teamwork. Exercises to understand the nature of a team, team building, members, and achieving a given task. Panel discussions.

MODULE - IV

Public speaking: Planning a speech, using presentations, speech outline, research for public speaking, language, and style, analysing audience, types of speeches and preparing for an impromptu speech. Stress Management Importance, Causes, Stress relief mechanisms

MODULE - V

Classroom activities are planned to ensure full student participation. The group and individual activities are

planned to develop the skills and talents of the students which they will need on various occasions in their careers. Time management; Critical Thinking; Lateral Thinking (Situational); Leadership Qualities; Motivation Business situation; Business plan presentation Vocabulary games; Presentation Skills

MODULE - VI

EVENT MANAGEMENT

Goal Setting; Analytical Thinking; Problem Solving; Emotional Quotient; Assertiveness; Stress Management

REFERENCE BOOKS

1. Krishna Mohan & Meera Banerji. Developing Communication Skills, Macmillan India
2. C S Rayudu. Principles of Public Relations, Himalaya Publishing House
3. K. Ashwathappa, Organizational Behavior, Himalaya Publishing House
4. Daniel Colman. Emotional Intelligence

Open Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VII	AR21B7O1	Industrial Building Systems	2	0	0	2	100	0	100

COs	Course Outcomes	POs	BTLs
CO1	To create awareness of the importance of urban housing in India	1,3,5,10	2
CO2	To understand the typologies in the Industrial buildings.	1,3,5,10	2
CO3	To understand the importance of modular coordination in industrial buildings.	1,3,5,10	2
CO4	To understand the importance of prefabrication systems	1,3,5,10	2
CO5	To understand the usage of equipment in industrial buildings and its socioeconomic factors of it.	1,3,5,10	2
CO6	To understand the techniques related to mass housing.	1,3,5,10	2

MODULE – I

INTRODUCTION: Five-year plans and thrust in housing – Issues in Urban Housing – use of modern building materials – application of modern technology – meaning of industrial building system.

MODULE – II

APPLICATION OF INDUSTRIAL BUILDING SYSTEM: Feasibility of using industrial building system in Residential and Non-Residential buildings – manufacturing of building components – Technology requirements for industrial building system – use of Industrial building system as an option for disaster mitigation.

MODULE – III

MODULAR CO-ORDINATION AND INDUSTRIALISED SYSTEM: Concept and definition of Modular dimensional discipline – Advantages and Limitations of modular principle.

MODULE – IV

PRE-FABRICATION SYSTEM: Objective and necessity – Off-site and on-site prefabrication elements and construction joints – architectural and technical limitations.

MODULE – V

PROCEDURES AND ORGANISATION: Equipment used – manufacturing processes – transportation of

components – assembly and finishing – Structural, social and economic issues related to the industrial building system.

MODULE – VI

RAPID CONSTRUCTION OF MASS HOUSING: Usage of Aluminium formwork and rapid construction techniques in housing projects.

REFERENCE BOOKS

1. Industrial Building and Modular Design Henrik Missen – C & CK, UK 1972.

2. Albert G.H. Dietz, Laurence Secotter – "Industrialized Building Systems for Housing "MIT, special summer session, 1970 USA.

3. "Industrialized Building Construction" – Proceedings of National Seminar, Nov-17- 18, 2000, Indian Concrete Institute, Mumbai.

4. "Innovative Construction Materials" – Proceedings of Seminar, Jan 20-21, 2001, Veermata Jeejabai Technical Institute, Mumbai.

EIGHTH SEMESTER

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8S1	Architectural Design – VII (Urban Design)	2	10	0	12	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the issues of conservation	1,2,3,4,5,6,7,8,9,10,11,12	2,3
CO2	To develop the identity of space, public and private scales of space	1,2,3,4,5,6,7,8,9,10,11,12	2,3
CO3	To understand the zoning, land use, density, development control	1,2,3,4,5,6,7,8,9,10,11,12	3,6
CO4	To understand the application of the Socio-economic profile of the user group.	1,2,3,4,5,6,7,8,9,10,11,12	3,6
CO5	To understand the NBC and other relevant codes	1,2,3,4,5,6,7,8,9,10,11,12	3,5,6
CO6	To understand the Hitech materials and constructions.	1,2,3,4,5,6,7,8,9,10,11,12	3,5,6

MODULE - I

Urban Design issues to be addressed:

- Issues of urban structure, urban space, and form.
- Issues of conservation.
- Issues in zoning, land use, density and development control.
- Issues of building in context, urban infill Integration of diverse functional needs, access systems, parking, services, etc.
- NBC and other relevant building codes as applicable.
- Relevant design considerations for barrier-free design for the differently abled.

DESIGN TASKS

The brief would be as per the area of study as suggested above.

E.g., Urban Design: Design of a multi-functional complex of buildings in the metropolitan context. Issues related to the growing problems or urban areas in third world countries and their future development shall be explored. Emphasis on the design with relation to the contextual environment, traffic and Planning controls and impact analysis.

An understanding of the architectural implications of such a development scheme should lead to insights into the formulation of political and administrative policy. Preparation of an analytical report of a high order and innovative presentation of final design proposals will be insisted upon.

Suggestive Typologies/ projects:
Design exercise could be any medium to large-scale project in the public domain, situated within an existing (and preferably compact) urban fabric, such as the redevelopment of commercial areas, waterfront development, transit hubs, market squares, densification along transit corridors and mixed-use complexes.

If intervention is in heritage areas, conservation strategies along with revitalization techniques can also be attempted. The projects thus undertaken as group work will have to ultimately contribute ideas for the improvement of the quality of the urban environment.

REFERENCE BOOKS

1. Alexander, Christopher. Pattern language: Towns, Buildings, Construction. Oxford University Press, New York.
2. Newman, Oscar, and Others. Defensible space: People and Design in the Violent City. Architectural Press, London, 1972.
3. Watson, Donald & Others (Ed.) Time-Saver Standards for Urban Design. McGraw Hill, New York

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8S2	Structures Project	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To review and evaluate the literature available related to the chosen problem	1,2,3,4,5, 6,7,8,9, 10,11,12	1,4
CO2	To identify, discuss and give the architectural solution to the chosen project in a comprehensive and systematic approach	1,2,3,4,5, 6,7,8,9, 10,11,12	1, 3, 6
CO3	To use various advanced tools and techniques to study existing systems	1,2,3,4,5, 6,7,8,9, 10,11,12	1, 3, 6
CO4	To understand teamwork and effectively communicate with team members.	1,2,3,4,5, 6,7,8,9, 10,11,12	1, 3, 6
CO5	To identify the scope of future studies	1,2,3,4,5, 6,7,8,9, 10,11,12	1, 3
CO6	To prepare project reports in the standard format	1,2,3,4,5, 6,7,8,9, 10,11,12	1, 2

COURSE CONTENT

Students have to design any structure, either in RCC or steel, which has been designed by them in the previous semesters.

The project should be at least G + 3 Floors. It may be either RCC framed structure or a steel structure and should include all basic structural elements.

REFERENCE BOOKS

1. S. Ramamrutham, Design of RCC Structures, Delhi, Dhanpati Rai Publishing
2. Dayaratnam, Design of RCC Structures, Allahabad, Wheelers Publishers
3. Ramachandra, Design of Steel Structures Vols. 1 and 2, Standard Publications, New Delhi
4. Vazirani and Raywani, Design of Steel Structures, Khanna Publishers, New Delhi

Professional Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8E1	Disaster Mitigation and Management	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the different types of natural disaster	1,3,5,6, 7,9,10	2
CO2	To understand Climate change and its impact on tropical cyclones	1,3,5,6, 7,9,10	2
CO3	To study the design considerations of windstorms and cyclones	1,3,5,6, 7,9,10	2
CO4	To analyse the Performances of Ground and Buildings in Past Earthquakes	1,3,5,6, 7,9,10	2
CO5	To study the General Planning and design consideration for Seismic effects related to building	1,3,5,6, 7,9,10	2,3
CO6	To study the case studies on disaster-resilient architecture	1,3,5,6, 7,9,10	2,3

MODULE - I

INTRODUCTION

A brief introduction to different types of natural disasters, Occurrence of disasters in different climatic and geographical regions, hazard (earthquake and cyclone) map of the world and India, Regulations for disaster risk reduction, Post-disaster recovery and rehabilitation (socioeconomic consequences) - case studies.

MODULE - II

IMPACTS ON CLIMATE CHANGE

Climate change and its impact on the tropical cyclone, Nature of cyclonic wind, velocities and pressure, Cyclone effects, Storm surge, Floods and Landslides.

The behaviour of structures in past cyclones and wind storms, case studies. Cyclonic retrofitting, strengthening of structures and adaptive sustainable reconstruction. Lifeline structures such as temporary cyclone shelters.

MODULE - III

DESIGN CONSIDERATIONS OF WIND STORMS AND CYCLONES

General planning/design considerations under windstorms & cyclones; Wind effects on buildings, towers, glass panels etc, & wind resistant features in the design. Codal Provisions, design wind speed, pressure coefficients

Coastal zoning regulation for construction & reconstruction phase in the coastal areas, innovative construction material & techniques, traditional construction techniques in coastal areas.

MODULE - IV

EARTHQUAKE IMPACT ON BUILDING TECHNOLOGY

Causes of an earthquake, plate tectonics, faults, seismic waves; magnitude, intensity, epicentre, energy release and ground motions. Earthquake effects – On ground, soil rupture, liquefaction, landslides.

Performance of ground and building in past earthquakes: Behaviour of various types of buildings, structures, and collapse patterns; Behaviour of Non-structural elements like services, fixtures, mountings- case studies. Seismic retrofitting- Weakness in existing buildings, ageing, concepts in repair, restoration and seismic strengthening.

MODULE - V

GENERAL PLANNING AND DESIGN CONSIDERATION

Building forms, horizontal and vertical Eccentricities, mass and stiffness distribution, soft storey etc.; Seismic effects related to building configuration. Plan and vertical irregularities, redundancy and setbacks

MODULE - VI

CASE STUDY

Local practices: traditional regional responses - case studies

REFERENCE BOOKS

1. Abbott, L. P. (2013). Natural disasters. 9th Ed. McGraw-Hill.
2. Aga Khan Award for Architecture. Ed. Shelter. (1996). The Access to Hope. AKDN, Istanbul and Geneva.
3. Agarwal, P. and Shrikhande, M. (2009). Earthquake Resistant Design of Structures. New Delhi : PHI Learning.
4. Alcantara, A. I. and Goudie, A. (2010). Geomorphological Hazards and Disaster Prevention. Cambridge: CUP.
5. Bankoff, G., Frerks, G. and Hilhorst, D. (2004). Mapping Vulnerability: Disasters, Development and People. London: Earthscan.
6. Burby, R. J. (1998). Cooperating with Nature. Confronting Natural Hazards with Land-Use Planning for Sustainable Communities. Washington: Joseph Henry Press.
7. Christopher, A. and Reitherman, R. (1982). Building configuration and Seismic Design. John Wiley & Sons Inc.
8. Dutta, S. C. and Mukhopadhyay, P. (2012). Improving Earthquakes and Cyclone Resistance of Structures:
9. Guidelines for the Indian Subcontinent. TERI.
   Dyrbye, C. D., Dyrbye, C. and Dyrbye, C. (1997). Wind Loads on Structures. John Wiley.
10. Foote, K. (2003). Shadowed Ground: How Americans deal with Places of Tragedy. Austin : The University of Texas Press.
11. Holmes, J. D. (2007). Wind Loading of Structures. 2nd Ed. Taylor & Francis.
12. ICIMOD. (2007). Disaster Preparedness for Natural Hazards: Current Status in India. Kathmandu: ICIMOD.
13. Judy, L. B. (2012). Climate change, Disaster Risk and the urban poor – cities building resilience for a changing World. Washington DC: The World Bank.
14. Lee, B. Ed. (2008). Hazards and the Built Environment: Attaining Built-In Resilience. Oxon : Taylor and Francis.
15. McDonald, R. (2003). Introduction to Natural and Man-made Disasters and their Effects on Buildings. Burlington: Architectural Press.
16. Oxford University Press. (2000). Confronting Catastrophe: New Perspectives on Natural

Disasters. London: OUP.
17. Singh, P. P. and Sharma, S. (2006). Modern dictionary of natural disaster. Deep & Deep Publications.
18. Smith, B. S. and Coull, A. (2001). Tall Building Structures: Analysis and Design. Willey–Inderscience.
19. Simiu E. and Scanlan R. H. (1996). Wind Effects on Structures-Fundamentals and Applications to Design. 3rd Edn., John Wiley.
20. Sinha, P. C. (2006). Disaster Mitigation, preparedness, recovery and Response. New Delhi: SBS Publishers.
21. Talwar, A. K. and Juneja, S. (2009). Cyclone Disaster Management. Commonwealth Publishers.
22. Taranath, B. S. (2004). Wind and Earthquake Resistant Buildings: Structural Analysis and Design. CRC Press.
23. Thomas, F. (2013). Designing to avoid disaster: The Nature of Fracture-Critical Design. London : Routledge.
24. Pelling, M. (2003). The Vulnerability of Cities: Social Resilience & Natural Disaster. London : Earthscan.
25. U.N.D.P. (2004). Reducing Disaster Risk: A Challenge for Development. New York: UNDP.
26. World Bank. (2009). Handbook for Reconstructing after Natural Disasters.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8E2	Intelligent Buildings	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To study the definitions of Intelligent Building and different areas of emphasis in various countries	1,3,5,8,9	2
CO2	To understand the cost-effective environment through optimization of four basic elements: structure, systems, services and management, and the interrelationship between them.	1,3,5,8,9	2
CO3	To understand the relationship between traditional Building Automation Systems (BAS) and BIoT (Building Internet of Things) BIoT technologies and applications	1,3,5,8,9	2
CO4	To study and understand the Integrated communications infrastructure	1,3,5,8,9	2
CO5	To understand the applications and Integration of information technology	1,3,5,8,9	2,3
CO6	To study the risks in generational skills gaps, etc in the building construction	1,3,5,8,9	2,3

MODULE - I

Definitions of Intelligent Building and different areas of emphasis in various countries; Organizations associated with intelligent buildings; Advantages of Intelligent Buildings; Relation between intelligent buildings and energy efficiency and sustainability

MODULE - II

Intelligent buildings as the achievement of a productive and cost-effective environment through optimization of four basic elements: structure, systems, services and management, and the interrelationship between them.

As an environment that maximizes the effectiveness of the building's occupants while enabling efficient management of resources with minimum lifetime costs of hardware and facilities

MODULE - III

Relation between traditional Building Automation Systems (BAS) and BIoT (Building Internet of Things) BIoT technologies and applications

Major recent shifts in building designs, operations, and use. Challenges of space optimization, energy efficiency, and connectivity vs. increasing occupant expectations of modern and flexible space design, improved comfort, productivity, and pervasive connectivity.

MODULE - IV

Integrated communications infrastructure that supports wired and wireless networks and applications. Person-to-person, person-to-machine, and machine-to-machine communications within the building and with the outside world using a state of the art intelligent, flexible, wired, and wireless platform. Use of wired LAN, Wi-Fi, in-building wireless, audio/visual, sensors, lighting, cloud connections, and building management applications.

MODULE - V

Applications and Integration of information technology (IT) into design and construction in HVAC, lighting and metering, Hot water system, Alarms, and security.

MODULE - VI

Risks in generational skills gaps, increasing capital expenses, project delays, and rising operational and maintenance costs.

New Operational procedures: system interoperability, remote monitoring, centralized command & control, building system analytics, unified user interfaces, and other big data tools for making data-driven decisions and operational efficiency. Reliability and security of these and failure due to skills gaps, mismanagement, or malicious intent. Cyber security implications for Building Automation Systems.

REFERENCE BOOKS

1. An Introduction by Derek Clements-Croome
2. Intelligent Buildings: Design, Management and Operation by Derek Clements-Croome
3. Intelligent Building Technology in Japan by Arthur Rubin
4. Smart Architecture – A Sustainable Approach for Transparent Building Components Design - Valentina frighi

Professional Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8E3	Furniture Design and Product Design	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the history of furniture from its early days to industrial resolution.	1,3,5,9, 10	2,3
CO2	To study Gestalt theory of design and Cost criteria of design & mass production of furniture forms.	1,3,5,9, 10	2
CO3	To understand the evaluation of functional and formal issues in design	1,3,5,9, 10	2
CO4	To study Ergonomics and its application in design	1,3,5,9, 10	2
CO5	To study the manufacturing process of furniture and product designs	1,3,5,9, 10	3
CO6	To understand the design aspects of products, Signage and Graphics	1,3,5,9, 10	2

MODULE - I

History of furniture from early days to industrial resolution. Study of various styles, systems, and products available in the market. The scientific way of designing any two types of furniture systems based on ergonomics, materials, working parameters and visual perception. Drawings details and models.

MODULE - II

Gestalt theory of design: Law of closure, the law of proximity, the law of continuity, etc. in India.
Cost criteria of design & mass production of furniture forms. Knowing and understanding modern furniture designers.

MODULE - III

Understanding of the functional and formal issues in design – study and evaluation of popular dictums such as “Form follows function”, form and function are one”, “Less is more”, “God is in details” etc. Evaluation of visual design for functional objects.

MODULE - IV

Human factors engineering and Ergonomic considerations; Principles of Universal Design and their application in furniture and product design.

Analysis of the form, function & technical aspects of existing furniture. Measured drawing of existing furniture – plan, elevations, and details.

MODULE - V

An introduction of various manufacturing processes most frequently adopted in furniture and product design such as Injection Moulding; investment casting, sheet metal work, die-casting, blow-mouldings, vacuum–forming, etc.

MODULE - VI

Signage and Graphics – Environmental graphics: signage categories and materials.

A detailed study involving the design aspects of any one of the following: Lifestyle accessories, Luminaire design, a piece of furniture, Point of Purchase design, Signage.

REFERENCE BOOKS

1. Hector Roqueta. Product design, London: teNeues, 2002.
2. Morley, John. The history of furniture: twenty-five centuries of style and design in the Western tradition, Boston: Little, Brown and Company, 1999.
3. Aronson, Joseph. The Encyclopedia of Furniture, 6th printing, New York: Crown Pub. 1944.
4. Saville, Laurel. Design secrets: furniture, Gloucester, Mass.: Rockport Publishers, 2006.
5. Datschefski, Edwin. The total beauty of sustainable products, Hove: Roto vision, 2001.
6. Papanek, Victor J. The green imperative: a natural design for the real world, New York: Thames and Hudson, 1995.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8E4	Building Information Modelling	2	1	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand drafting modelling and limitations of BIM	1,2,3,5, 8,9,10	2
CO2	To develop 3d parametric software by using REVIT	1,2,3,5, 8,9,10	2
CO3	To develop central mode share access across all consultants	1,2,3,5, 8,9,10	2,3
CO4	To develop execution drawings including all services	1,2,3,5, 8,9,10	2,3
CO5	Introduction to 4D & 5D	1,2,3,5, 8,9,10	2,3
CO6	To develop LOD and shop drawings using BIM software.	1,2,3,5, 8,9,10	2,3

MODULE - I

INTRODUCTION HISTORY: building design process with purely drafting & modelling software and its limitations and disadvantages

Difference between purely drafting & modelling software and BIM software.

MODULE - II

BASICS OF PRODUCING BUILDING DESIGN USING BIM SOFTWARE

Introduction to Parametric 3D modelling and exploration of its advantages (Shall include Architectural, Structural, Electrical, Mechanical, and all specialist consultant's elements) using any of the popular BIM software, preferably Revit 2018, Autodesk – the most popular software.

Project Elements Planning – Creation of Project Tree. Hierarchical Identity creation of the project elements and intelligent internationally recognizable naming system.

Building design – Creation of a Digital Model of a building and its geophysical location; creation of elemental details.

MODULE - III

Creation of Elements families. Import of elements of all related trades. Format of digital model (IFC; acceptable formats and its advantages). Preparation of Project Documentation and Rendering.

Preparation of Schedules and BOQ (quantity take-off). Solar Studies – Daylighting simulation

MODULE - IV

BIM INFORMATION SHARING

Concept of Central Model ownership of the digital model and interoperability. Location of the Central Model Access to model for the project's various stakeholders – The Client, Architect, Project Managers, Contractor, Structural Engineer, Electrical Engineer, Mechanical Engineer, all specialist consultants, and Vendors in some cases. Other ways of exchange of information, in case of non-availability of a common platform like the internet.

MODULE - V

BIM AS A PROJECT DESIGN AND MANAGEMENT TOOL

Introduction to 4D and 5D. Project Estimate and Scheduling; Linking of software like MS Project, Primavera and MS Excel to BIM. Exchange and Analysis of information Pre-construction study; project optimization.

BIM as a tool to integrate Sustainability issues into the building design and construction process; linking various sustainability-related applications, output, and Analysis. Construction process and Constructability.

MODULE – VI

BIM EXECUTION PLAN

Formats are being used in different parts of the world to prepare a BIM execution plan. Need to prepare a project-specific BIM Execution plan. LOD (Level of Development) for project-specific requirements – production of Design Drawings, production of Working Drawings, coordination of various trades plus Clash Detection, production of Shop Drawings, as-built drawings, and compilation of information for Facility Management (COBIE, etc.).

REFERENCE BOOKS

1. Revit 2022 Suite _ Complete Reference Series, Mc Graw Hill Publication
2. Mastering Revit Architecture - Demchak, Dzambazova&Krygiel
3. BIM Handbook / Eastman, Teicholz, Sacks, Liston / Wiley
4. Optional: BIM and Construction Management: Proven Tools, Methods, and Workflows / Hardin / Sybex — A BIM reference with a focus on construction management BIM – Willern Kymmell

Professional Ability Enhancement Compulsory Courses

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8C1	Project Management	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the Objectives and Methods of a project Management System	2,4,5,9, 10,11,12	2
CO2	To understand various Tools and Techniques to facilitate efficient Management of Projects – CPM.	2,4,5,9, 10,11,12	2
CO3	To understand various Tools and Techniques to facilitate efficient Management of Projects – PERT.	2,4,5,9, 10,11,12	2
CO4	To analyze the Project cost model and steps involved in cost optimization	2,4,5,9, 10,11,12	3
CO5	To apply Scientific Evaluation Techniques to Manage Project Duration and resources with Examples	2,4,5,9, 10,11,12	4
CO6	To apply all the above techniques and create a sample Work breakdown structure.	2,4,5,9, 10,11,12	4

MODULE - I

INTRODUCTION TO PROJECT MANAGEMENT: Project management concepts-objectives, planning, scheduling Controlling and the role of the decision in project management. Method of planning and programming, Human aspects of project management, work breakdown structure, Traditional management system, Gantt's approach, Load chart. Progress Chart, Development of bar chat, Merits and Demerits

MODULE - II

PROJECT PROGRAMMING AND CRITICAL PATH METHOD: Project Network-Events Activity, Dummy, Network Rules, Graphical Guidelines for Network, Numbering the events, Cycles, Development of Network-planning for Network Construction, Models of Network construction, steps in the development of Network. Work Break Down Structure, Hierarchy. Concepts: critical path method-process, activity time estimate, Earliest Event time, Latest allowable Occurrence time, start and finish time of activity, float, critical activity and critical path-problems.

MODULE - III

PROGRAMMING EVALUATION REVIEW TECHNIQUE: PERT network, introduction to the theory of probability and statistics. Probabilistic time estimation for the activities of PERT Network.

MODULE - IV

PROJECT TIME REDUCTION AND OPTIMIZATION: Project cost, Indirect project cost, direct project cost, the slope of the direct cost curve, TOTAL project cost and optimum duration, contracting the network for cost optimization, steps in cost-time optimization.

MODULE - V
PROJECT UPDATING: When to update? Data required for updating, steps in the process of updating Resource usage profile: Histogram, Resource smoothing and Resource levelling, Computer applications in project management.
MODULE - VI
Create a WBS Structure of a Residential building with all the activities and events involved in it.
TEXTBOOKS
1. Dr. B.C. Punmia and K.K. Khandelwal-Project planning and control with PERT/CPM, Laxmi publications, New Delhi, 2018 2.
REFERENCE BOOKS
1. S.P.Mukhopadyay, project management for Architect and civil Engineers, IIT, Kharagpur, 1974 2. Jerome D.Wiest and Ferdinand K.Levy, A Management Guide to PERT, CPM, Prentice Hall of India Pub, Ltd., New Delhi, 1982 3. R.A. Burgess and G.White, Building production and project Management, The construction press, London, 1979

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8C2	Dissertation	1	0	3	4	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the Objectives of the Thesis project, topic & typologies	1,2,3,4,5, 6,7,8,9, 10,11,12	2
CO2	To understand concepts in architecture under different aspects	1,2,3,4,5, 6,7,8,9, 10,11,12	2
CO3	To understand research methodology, data collections	1,2,3,4,5, 6,7,8,9, 10,11,12	2
CO4	To understand report writing	1,2,3,4,5, 6,7,8,9, 10,11,12	2
CO5	To understand the presentation of a report	1,2,3,4,5, 6,7,8,9, 10,11,12	2
CO6	To collect required data and get a review of it.	1,2,3,4,5, 6,7,8,9, 10,11,12	2

MODULE – I

INTRODUCTION TO ARCHITECTURAL THESIS PROJECT: Difference between design thesis and design studio, selection of topics for architectural design thesis, design thesis topics based on building typologies, preparation of synopsis, Methodology of design thesis

MODULE – II

Emerging concepts in architecture due to changes in social, economic and technological variables. Review of design projects related to real-world instances and relevant to the community at large.

Review of projects of design complexity, involving themes, sub-themes, and architectural expression.

MODULE – III

RESEARCH IN ARCHITECTURE: Tools and Methods required to handle a design project. Scientific methods of research with special emphasis on architectural research methods. Architectural inquiry visual, observations, questionnaire formats of inquiry, Literature Review, and case studies. Data analysis techniques interpretation of data

MODULE – IV

THESIS REPORT WRITING AND PRESENTATION:

- Formats for the presentation of data, case studies, and analysis.
- Formats for the presentation of thesis design- media appropriate in the architectural profession such as two-dimensional drawing, physical models and three-dimensional computer models.

MODULE - V

REPORT WRITING: Techniques in report writing, presentation of contextual information relevant to the interpretation of the data collected and design; reporting the design development from concept to design solution, explaining the relation of the design to existing knowledge on the topic in the form of coherently written thesis report.

MODULE - VI

CHOOSING A THESIS TOPIC:

The input to the students on various design thesis topics would be in the form of Expert /Guest Lectures Each student in consultation with the faculty shall choose a thesis topic, collect necessary data, review the literature on the chosen topic and present a written paper and seminar at the end of the semester

REFERENCE BOOKS

1. Mukhi, H.R. Technical Report Writing: Specially prepared for Technical and Competitive Examinations, New Delhi: Satya Prakashan, 2000.
2. Barrass, Robert. Writing At Work \b a guide to better writing in administration, business, and management, London: Routledge, 2003.
3. Seely, John. The Oxford guide to effective writing and speaking, 2nd ed., Oxford; New York: Oxford University Press, 2005.
4. Jo Ray McCuen, Anthony Winkler. Readings for writers, 9th ed., Fort Worth: Harcourt Brace College Publishers, 1998.
5. Treece, Malra. Effective reports, 2nd ed., Boston: Allyn and Bacon, 1985

Open Electives

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
VIII	AR21B8O1	Open Elective (MOOCS)	2	0	0	2	100	0	100

COURSE CONTENT

The topics of the open elective are displayed as per department's discretion at the beginning of the semester.

Emerging topics will be introduced as an open elective by each department of the university.

The student can opt for any of those electives which they feel would emphasize their academic/personal potential. The course is structured to understand and develop the skills of the open elective opted.

The effective time of the open elective will be decided and informed to students as per university norms.

NINTH SEMESTER

Professional Ability Enhancement Compulsory Courses

1	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
IX	AR21B9PT	Practical Training	0	0	30	30	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To expose students to the daily realities of architectural practice through Practical Training	1,3,4,5,6,8,9,10,12	2
CO2	To facilitate an understanding of the evolution of an architectural project from design to execution.	1,3,4,5,6,8,9,11,12	2
CO3	To enable an orientation that would include the process of development of conceptual ideas and presentation skills.	1,3,4,5,6,8,9,10,12	3
CO4	Involvement in office discussions, client meetings and development of concepts into working drawings and tendering procedures.	1,3,4,5,6,8,9,10,12	4
CO5	Site supervision during execution and coordination with the agencies involved in the construction process.	1,3,4,5,6,8,9,10,12	4
CO6	To document all the work student has undergone during the period.	1,3,4,5,6,8,9,10,12	3

Course Contents

Every student must work in an Architect's Office as a full-time trainee for a period of 20 calendar weeks (excluding Viva-voce) from the date of commencement of training. The Chief Architect in the firm should be registered with the Council of Architecture and have a minimum of five years of practical/professional experience after her/his graduation.

The student should involve herself/himself in various aspects of work in an office like working drawings, presentation drawings, quantity and cost estimation, site supervision, municipal drawings, etc.

NOTE:

Detailed instructions which may be given by the University regarding the training, the frequency of reporting to the department, etc. are to be followed strictly. After completion of training, every student will have to submit a detailed report with a set of drawings on at least four projects on which she/he has worked during the practical training period.

Evaluation

The Internal Assessment shall be evaluated at the end/towards the end of the training period and shall be conducted by the faculty deputed by the department in the institute.

- The Internal Assessment shall be of 100 marks. Each college can decide on the mode of evaluation of the work, either by deputing a faculty member of the College to visit the architect's office or by

assessing the work at the Institute, just preceding the External Assessment. The monthly reports, Logbook maintained, and reports from the Architect will be considered for Valuation. Each College will follow a uniform policy for all students in the College.

- The detailed report and drawings prepared during practical Training by students will be evaluated at a viva-voce by a jury consisting of one External member and one Internal member (Practical Training Co-ordinator or his nominee and Head of the Department or his nominee.

- The Department shall arrange for the conduct of the viva-voce examination after the submission of the report the department will arrange. Students who are interested in training abroad are permitted to do so. The Chief Architect should be licensed/registered with the local appropriate authority and should have been in practice for a minimum of five years. The faculty members may satisfy themselves about the architects by checking the website, but the primary onus of the selection depends on the student. The student and Parent/Guardian must sign an undertaking to be wholly responsible for the expenses, safety and accommodation of the student beforehand.

Additional Information

- A counselling session should be arranged for the students before they start applying to architects' offices for internship positions. Apart from faculty members, practicing architects should also be invited to orient the students and guide the students on formats and etiquette of applications, remuneration, work, discipline expectations etc.
- Before giving final permission for training abroad the college should conduct a background check of the architect (by seeing the website, listed projects etc.)
- To ensure that students are aware of the options available to them, the College should put up a list of all firms who are willing /interested in taking trainees.
- An Open Day may be organized at The College with a display of student's works and invite architects to view the works and select students for training.
- The College should compulsorily check the portfolios/profiles of the students before submission to the architects' offices.
- The work done at the office may also include a small component of research related to an ongoing project. The student may take up a study to give specific inputs or relate to a new material or product etc. However, such work should not engage the student for more than 2 (two) weeks.
- The student should submit a 1000-word report on the projects that they have worked on which should include salient features such as design methodology, special construction features etc.
- The letter from the College to the architect at the time of the student's joining should contain the starting and ending dates of training. The HoD/ Practical Training Co-ordinator should inform the architect directly by email or letter of the dates when the student is expected to report at the college.
- The students may be permitted to change the office of training only once, with prior permission from the College and strictly only where there are compelling reasons. Such cases may be dealt with on a case-by-case basis based on the merits of the situation.

TENTH SEMESTER

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
X	AR21B10TH	Design Thesis	2	22	0	24	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the design thesis based on the preliminary work undertaken in the Pre-Thesis seminar	1,2,3,4,5,6,8,10,11	6
CO2	To get the Architectural Design proposals	1,2,3,4,5,6,8,10,11	6
CO3	To submit all original drawings	1,2,3,4,5,6,8,10,11	6

COURSE CONTENT

The Architectural Thesis is the culmination of the development of the student's knowledge, attitudes and skills over the course of studies in architecture. It is an occasion for exercising conscious choices in the field based on the student's abilities and inclinations, and for testing out his commitment. The student, in consultation with the faculty, is expected to demonstrate through an imaginative approach, his expertise in effecting positive changes in our built environment.

TENTATIVE TOPICS OF STUDY

The areas of study/research/design can include any of the broad areas of the discipline contemporary needs of society, history, theory, sustainability, structural or service-oriented design, projects that involve complex planning and integration of several aspects, appropriate architecture, urban design, contemporary processes, social housing, urban-oriented architectural design, conservation-oriented architectural design, etc.

SUBMISSION REQUIREMENTS

The progress of work will be reviewed periodically throughout the semester. At the end of the semester, students should submit the final thesis project for the viva-voce exam. The final submission will comprise study sheets, optional study models, design approach sheets, optional design process models, design presentation sheets, a final model, detailed drawings of an important part of the project, a project report summarising the entire thesis work and a soft copy of all the work.

REFERENCE BOOKS

1. Mukhi, H.R. Technical Report Writing: Specially prepared for Technical and Competitive Examinations, New Delhi: Satya Prakashan, 2000.
2. Barrass, Robert. Writing At Work a guide to better writing in administration, business, and management, London: Routledge, 2003.
3. Seely, John. The Oxford guide to effective writing and speaking, 2nd ed., Oxford; New York: Oxford University Press, 2005.
4. Jo Ray McCuen, Anthony Winkler. Readings for writers, 9th ed., Fort Worth: Harcourt Brace College Publishers, 1998.
5. Treece, Malra. Effective reports, 2nd ed., Boston: Allyn and Bacon, 1985

Professional Ability Enhancement Compulsory Courses

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
X	AR21B10C1	Professional Practice and Building Codes	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To expose students to the daily realities of architectural practice through Practical Training	6,10,12	2
CO2	To enable an orientation that would include the process of architectural practice	3,4,6,9	2
CO3	To facilitate an understanding of the evolution of an architectural project from design to execution.	3,6,8,10	2
CO4	Involvement in office discussions, client meetings, development of the concepts into working drawings, tendering procedure and awareness of the Legal factors involved in it.	5,6,8,9,10	2
CO5	To understand the different types of contracts and Tendering process of a project.	1,6,9,10,11	2
CO6	To create an awareness of the building rules and regulations governed by the different authorities.	1,6,7,8,10	2

MODULE - I

ARCHITECTURE PROFESSION:
Importance of the Architecture Profession, the role of Architects in society, Architects Act 1972, Amendments & Provisions, registration of architects, relations with clients, contractors, consultants and public authorities. Ways of getting works; types of works, works partly executed by other architects; precautions to take before taking up the work; conditions of engagement between the architect and client. Role of Council of Architecture and Indian Institute of Architects, functions, constitution, and rules & regulations. Code of professional conduct & Ethics, Social responsibility, Publications.

MODULE - II

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. Salaried appointment in public & private sector jobs, Architectural Competitions procedure. The scale of charges, applicable building byelaws, municipal approvals, development controls, zoning regulations, National Building Code, Master plan and Zonal plan.

MODULE - III

ARCHITECT'S OFFICE: Architect's office management, organization structure, responsibility towards employees, consultants & associates, maintenance of accounts, filing of records, balance sheet, Income tax, Service tax and Professional tax. Copyrights and patenting, correspondence, documentation, drawings,

conducting meetings, Clerk of works, inspection, works measurement, certificate of payment to contractors, applicable legislation, registration of properties, stamp duty; insurance for new work and additions; an insurable value of the property, claim for damages.

MODULE - IV

Arbitration, Valuation and Easements Need/Scope of Arbitration, Indian Arbitration act, arbitrators, umpires, appointment, conduct, powers, duties, Sole/Joint arbitrators, Arbitration procedure, awards & impeachment.

Techniques/elements of valuation, factors affecting the valuation of land/building, compensation on the acquisition, lease renewal/extension, standard rent, Cost of sale, Purchase & Mortgage. Easements, types, rights & features; acquisition/extinction/protection; Interim/permanent/ mandatory injunctions. Dilapidation, insurance and estate development. Consumer protection act

MODULE – V

TENDER & CONTRACT: Tender – Definition – Types of Tenders – Open and closed tenders – Conditions of tender – Tender Notice – Tender documents – Concept of EMD – Submission of tender -Tender scrutiny – Tender analysis – Recommendations –Work order – E-tendering (advantages, procedure, conditions). Contract – Definition – Contract agreement – its necessity – Contents (Articles of Agreement, Terms and Conditions, Bills of Quantities and specifications, Appendix) – Certification of Contractors Bills at various stages.

New trends in project formulation and different types of execution (BOT, DBOT, BOLT, BOO, etc.) – Execution of projects – The process (Expression of interest, Request for Proposal, Mode of Evaluation of Bids, Award of work)

MODULE - VI

BUILDING CODES (NATIONAL BUILDING CODE, AND LOCAL CODES): Study of building byelaws to enable to design and prepare drawings for submission to concerned bodies and an understanding of the administrative processes for obtaining building permission. General Land-use, building classifications and permissible uses; Norms for exterior and interior open spaces, Setbacks and margins, norms for building projections in open spaces, considerations in FAR, guidelines for open green areas.

Requirements for various parts of buildings, building height regulations, multi-storey regulations Requirements of parking spaces and vehicular movements, Nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster-prone regions, coastal zones, hilly areas, etc. Norms for Fire Protection for various building classifications, norms for fire-exit ways and building materials, the concept of fire zoning, doorways, stairways, passages and corridors, fire escapes etc.

REFERENCE BOOKS

1. Banerjee, D.N. Principles and Practice of Valuation, 5th ed. Eastern Law House, Calcutta, 1998.
2. Dalton, J. Patrick. Land Law, 4th ed. Pitman Pub., London, 1996.
3. Indian Institute of Architects. H.B. Professional Practice. The Architects Pub. Bombay.
4. Indian Standards Institution. National Building Code of India 1983. Indian Standards Institution, New Delhi, 1984.
5. Namavati, H. Roshan. Professional Practice, 8th ed. Lakahani Book Depot, Bombay, 2001.

6. Namavati, H. Roshan. Theory and Practice of Valuation, 2nd ed. Lakahani Book Depot, Bombay, 1991.
7. M. Dedbhkth Architectural practice in India by Prof.M.Deobhkta
8. V. S Apte : Architectural Practice Procedures
9. Municipal Bye-laws AND DTCP Rules.
10. Indian Standards Institution. National Building Code of India 1983. Indian Standards Institution, New Delhi, 1984.
11. Scott, G. James. Architectural Building Codes, New York: Vanstrand Reinhold.

Semester	Course Code	Course Title	L	S	P	C	Int. Marks	Ext. Marks	Total Marks
X	AR21B10C2	ENTREPRENEURSHIP SKILLS FOR ARCHITECTS	3	0	0	3	50	50	100

COs	Course Outcomes	POs	BTLs
CO1	To understand the concept of entrepreneurship versus paid employment	6,8,9, 10,11,12	2
CO2	To study the Legal aspects of becoming an architectural entrepreneurship.	6,8,9, 10,11,12	2
CO3	To learn social media and Marketing platforms.	6,8,9, 10,11,12	2
CO4	To learn about revenue studies.	6,8,9, 10,11,12	2
CO5	To study time management and the role of clients	6,8,9, 10,11,12	2,3
CO6	To learn about the skills required in architectural presentation.	6,8,9, 10,11,12	2,3

MODULE - I

INTRODUCTION TO ENTREPRENEURSHIP

An introduction to entrepreneurship versus paid employment. The directions ahead for young Professionals. Basic concepts of partnerships, proprietorship, private and public limited companies

MODULE - II

LEGAL ASPECTS

Legal aspects of becoming an architectural entrepreneur in the Indian environment. Statutory requirements and formalities, Insurance, taxation, documentation and records. Special statutes pertaining to the architectural profession.

MODULE - III

CONCEPT OF WORKSPACE

The concept of workspace-shared workspace. Outreach-the use of social media and marketing platforms.

MODULE - IV

ECONOMICAL ASPECTS

Setting up establishment-capital and revenue studies, planning for business, review of strategy, tapping of lateral opportunities, SWOC studies.

MODULE - V

TIME MANAGEMENT AND THE ROLE OF CLIENTS

Time management-the role of clients, contractors, and service providers

MODULE - VI

PRESENTATIONAL SKILLS

The skills of architectural presentation and the management of project delivery

REFERENCE BOOKS

1. H.Nandan, Fundamentals of Entrepreneurship, PHI, 3rd Edition 2013
2. Rajeev Roy, Entrepreneurship, Oxford, 2nd edition 2011