BACHELOR OF ARCHITECTURE (B.ARCH)

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

BACHELOR OF ARCHITECTURE

SEMESTER - I

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 101	ARCHITECTURAL DESIGN - I	1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 HRS.
2	RAR - 102	CONSTRUCTION & MATERIALS - I	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 103	ARCHITECTURAL STRUCTURES - I	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 104	ARCHITECTURAL DRAWING - I	1	0	5	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 105	ARTS & GRAPHICS - I	1	0	5	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 106	ECOLOGY & ENVIRONMENT	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 107	COMMUNICATION SKILLS&TECHNIQUES	1	1	0	15	35	**50**	50	0	**50**	**100**	1	3 HRS.
8	RAR - 108	COMPUTERS	1	1	0	15	35	**50**	0	0	**0**	**50**	1	X
	RVE - 101	**UNIVERSAL HUMAN VALUES & PROFESSIONAL ETHICS**	3	0	0	10	20	**30**	70	0	**70**	**100**	3	2 HRS.
		TOTAL	**13**	**4**	**19**	**36**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

BACHELOR OF ARCHITECTURE

SEMESTER - II

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 201	ARCHITECTURAL DESIGN - II	1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 HRS.
2	RAR - 202	CONSTRUCTION & MATERIALS - II	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 203	ARCHITECTURAL STRUCTURES - II	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 204	ARCHITECTURAL DRAWING - II	2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 205	ARTS & GRAPHICS - II	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 206	SURVEYING	1	0	2	15	35	**50**	50	0	**50**	**100**	1	3 HRS.
7	RAR - 207	HISTORY OF ARCHITECTURE - I	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 208	RESEARCH / SEMINAR / WORKSHOP - I	1	2	0	15	35	**50**	0	0	**0**	**50**	1	X
	RUC - 201	**CYBER SECURITY**	3	0	0	10	20	**30**	70	0	**70**	**100**	3	2 HRS.
		TOTAL	**12**	**6**	**15**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

BACHELOR OF ARCHITECTURE (B.ARCH)

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

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SEMESTER - III

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 301	ARCHITECTURAL DESIGN - III	1	0	5	30	70	**100**	75	25	**100**	**200**	6	7 HRS.
2	RAR - 302	CONSTRUCTION & MATERIALS - III	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 303	ARCHITECTURAL STRUCTURES - III	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 304	ARCHITECTURAL DRAWING - III	2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 305	ARTS & GRAPHICS - III	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 306	ARCHITECTURAL SERVICES - I	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 307	HISTORY OF ARCHITECTURE - II	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 308	RESEARCH / SEMINAR / WORKSHOP - II	1	1	0	15	35	**50**	0	0	**0**	**50**	1	X
9	RAR - 309	CLIMATOLOGY	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
		TOTAL	**13**	**7**	**13**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

BACHELOR OF ARCHITECTURE (B.ARCH)

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

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SEMESTER - IV

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 401	ARCHITECTURAL DESIGN - IV	1	0	5	30	70	**100**	75	25	**100**	**200**	6	7 HRS.
2	RAR - 402	CONSTRUCTION & MATERIALS - IV	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 403	ARCHITECTURAL STRUCTURES - IV	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 404	ARCHITECTURAL DRAWING - IV	2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 405	ARTS & GRAPHICS - IV	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 406	ARCHITECTURAL SERVICES - II	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 407	HISTORY OF ARCHITECTURE - III	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 408	RESEARCH / SEMINAR / WORKSHOP - III	1	1	0	15	35	**50**	0	0	**0**	**50**	1	X
9	RAR - 409	VERNACULAR ARCHITECTURE	1	0	1	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
		TOTAL	**13**	**6**	**14**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

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SEMESTER - V

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 501	ARCHITECTURAL DESIGN - V	1	0	8	30	70	**100**	75	25	**100**	**200**	6	7 HRS.
2	RAR - 502	CONSTRUCTION & MATERIALS - V	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 503	ARCHITECTURAL STRUCTURES - V	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 504	INTERIOR DESIGN	1	0	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 505	WORKING DRAWINGS & DETAILS	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 506	ARCHITECTURAL SERVICES - III	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 507	HISTORY OF ARCHITECTURE - IV	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 508	RESEARCH / SEMINAR / WORKSHOP - IV	1	1	0	15	35	**50**	0	0	**0**	**50**	1	X
9	RAR - 509	SOCIOLOGY	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
		TOTAL	**12**	**5**	**16**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

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SEMESTER - VI

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 601	ARCHITECTURAL DESIGN - VI	1	0	8	30	70	**100**	75	25	**100**	**200**	6	7 HRS.
2	RAR - 602	CONSTRUCTION & MATERIALS - VI	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 603	ARCHITECTURAL STRUCTURES - VI	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 604	DISASTER MANAGEMENT	1	2	0	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 605	ESTIMATION & SPECIFICATION	1	2	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 606	ARCHITECTURAL SERVICES - IV	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 607	HISTORY OF ARCHITECTURE - V	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 608	RESEARCH / SEMINAR / WORKSHOP - V	1	1	0	15	35	**50**	0	0	**0**	**50**	1	X
9	RAR - 609	BUILDING ECONOMICS	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
		TOTAL	**12**	**9**	**12**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

BACHELOR OF ARCHITECTURE (B.ARCH)

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

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SEMESTER - VII

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 701	PRACTICAL TRAINING	-	-	-	-	400	**400**	-	**400**	**400**	**800**	20	X
2	RAR - 702	SEMINAR / PRESENTATION	-	-	-	-	100	**100**	-	**100**	**100**	**200**	4	X
		TOTAL										**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

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BACHELOR OF ARCHITECTURE

SEMESTER - VIII

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 801	ARCHITECTURAL DESIGN - VII	1	0	8	30	70	**100**	75	25	**100**	**200**	7	7 HRS.
2	RAR - 802	CONSTRUCTION & MATERIALS - VII	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 803	ARCHITECTURAL STRUCTURES - VII	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 804	TOWN PLANNING	1	0	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.
5	RAR - 805	ELECTIVE - I (SKILL BASED)	1	0	2	30	70	**100**	0	0	**0**	**100**	2	X
6	RAR - 806	ARCHITECTURAL SERVICES - V	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 807	THEORY OF ARCHITECTURE	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
8	RAR - 808	DISSERTATION	1	3	0	0	150	**150**	0	0	**0**	**150**	2	X
	TOTAL		**11**	**6**	**16**	**33**						**1000**	**24**	
	GRAND TOTAL											**1000**	**24**	

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SEMESTER - IX

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 901	ARCHITECTURAL DESIGN - VIII	1	0	8	30	70	**100**	75	25	**100**	**200**	7	7 HRS.
2	RAR - 902	CONSTRUCTION & MATERIALS- VIII	2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.
3	RAR - 903	PROFESSIONAL PRACTICE - I	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
4	RAR - 904	LANDSCAPE DESIGN	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
5	RAR - 905	ELECTIVE - II (P.G. PREPARATORY)	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
6	RAR - 906	ADVANCED SERVICES	1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
7	RAR - 907	ADVANCED SURVEYING & GEOMATIC TECHNIQUES	1	0	2	30	70	**100**	0	0	**0**	**100**	1	X
8	RAR - 908	ARCHITECTURAL THESIS - I	1	0	3	0	100	**100**	0	50	**50**	**150**	4	X
	TOTAL		**10**	**2**	**21**	**33**						**1000**	**24**	
	GRAND TOTAL											**1000**	**24**	

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SEMESTER - X

SCHEME OF TEACHING AND EXAMINATION

S. NO.	SUBJECT CODE	NAME OF THE SUBJECT	PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER FOR A.K.T.U.
			LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
						CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	RAR - 1001	ARCHITECTURAL THESIS - II	1	0	26	-	450	**450**	-	350	**350**	**800**	20	X
2	RAR - 1002	PROFESSIONAL PRACTICE - II	2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
3	RAR - 1003	ELECTIVE - III (MISCELLANEOUS)	1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.
		TOTAL	**4**	**1**	**28**	**33**						**1000**	**24**	
		GRAND TOTAL										**1000**	**24**	

DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW.

B.ARCH. CREDIT SCHEDULE FOR ALL SEMESTERS
&
SYLLABUS FOR FIRST & SECOND SEMESTERS
IN ACCORDANCE TO CHOICE BASED CREDIT SYSTEM

TO BE EFFECTIVE FROM THE SESSION 2016 - 17

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 101, ARCHITECTURAL DESIGN - I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 HRS.

OBJECTIVES

- Orientation of students to the profession of architecture.
- Introduction to basic design and the basic understanding of form and space in architecture.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1	**Orientation to the Architecture Profession**	Role of an Architect in the built environment. Building process, Role of other professional in building. A general survey of the changes in habitat in history. Architects act, C.O.A., I.I.A., NASA.
Module-2	**Space and Architecture**	Understanding design as to create for a particular purpose and architectural design as to create space – exercise in terms of simple drawing and sketching of objects available in nature and surroundings. Form created through lines (columns) and planes (volumes), combination thereof.
Module-3	**Form and Transformations**	Additive, Dimensional, Subtractive- exercises primarily through 3-D models of simple geometrics.
Module-4	**Scale in Architecture**	Simple measurement exercises.
Module-5	**Order in Architecture**	Geometrical, Structural, Dimensional, Material, Spatial order - through observation of surroundings as well as simple exercises in 2-D and 3-D. Exercises in order and transformations of form and space.

REFERENCE BOOKS

1. Ching, Francis D. K. “Architecture : Form, Space and Order”, John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, “Universal Principles of Design”, Rockport – Publications, Massachussets.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Design Exercises of Module 2 - 5**	**8**	**8**	**64**
2	**Tutorial of Module - 1**	**1**	**6**	**6**
			TOTAL	**70**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 102,CONSTRUCTION & MATERIALS – I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To familiarize the students with constituents, properties and uses of traditional building materials used in construction.
- To understand the usage ofthese traditional building materials in simple building works.
- To develop skills in understanding the complexities & constrains of brick masonry.
- To familiarize the student with the basic building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	**Clay & Clay Products**	Mud including stabilised earth, Burnt Brinks, Brick Tiles, Brick Ballast and Surkhi
Module-2	**Lime**	Availability, Preparation and Uses
	Cement	Manufacture and Properties.
	Sand &Surkhi	Characteristics, Availability and Uses.
Module-3	**Mortar**	Mud, Lime, Cement.
	Concrete	Lime, Cement.

LIST OF ASSIGNMENTS (Markrt Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit brick kiln/ lime kiln/ cement factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4	**Workshop/Constructi on Yard Practice**	Practicing in construction yard by making the examples of brick masonry works etc.
Module-5	**Site Exposure**	Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in masonry works.
2. To construct examples of brickmasonry works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6	**Element of Building**	Terminology, Nomenclature of various parts of building from foundation to roof.
Module-7	**Brick Work**	Brick Terminology, Simple Bonds e.g. English bond & Flemish (single and double) bond in brick work for up to two brick thick walls.
Module-8	**Brick Work**	Details at quoins andjunctions in English bond and Flemish bond for up to two brick thick walls.
Module-9	**Brick Work**	Details of piers (attached and detached), Buttresses, Lintel and Sill. Corbelling, Coping, String courses.
Module-10	**Brick Work**	Special Bond - Rat Trap Bond. Brick jalis.

CONSTRUCTION PLATES

1. To understand the types of bricks.
2. To understand square stopped ends of said bonds in brick masonry.

3. To understand L, T and X Junctions of said bonds in brick masonry.
4. To understand of piers (attached and detached), Buttresses, Lintel, Sill, Corbelling, Coping, and String Courses.
5. To understand Special Bond - Rat Trap Bond.
6. To understand the application of Cavity walls and Brick jails in brick masonry

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian climatic conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
3. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
4. The Construction of Buildings – Barry Volume I, II, III and IV
5. Chudley, Roy, "Construction Technology", Longman, 2005.
6. Building Construction_Mitchell (Elementary and Advanced)
7. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
8. Building Construction-Bindra&Arora.
9. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
10. Building Materials by SC Rangwala: Charotar Pub. House, Anand
11. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill
12. Publishers, New Delhi, 2011.
13. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
14. National Building Code of India (Latest Edition), Bureau of Indian Standards.
15. Engineering Materials-Deshpande.
16. Engineering Material-Roy Chowdary
17. Designing with models – Criss. B. Mills.
18. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
19. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
20. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
21. Wenninger (Magrus.J.) Spherical Models, Cambridge University Press, 1979

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey&Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – I
RAR – 103, ARCHITECTURAL STRUCTURES-I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES:

- To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

Module-1	**Elements of Statics**	Force, Law of parallelogram of forces, Law of triangle of forces, Polygon Law of forces, Resolution of forces. Resultant of number of concurrent coplanar forces. Condition of equilibrium, Moment of force, Moment and arm of couple, Theorems on couples.
Module-2	**Simple Stresses and Strains**	Elasticity, Stress, Strain, Types of stresses, Elastic limit, Hook's law, Modulus of elasticity, Modulus of rigidity, Bulk modulus, Stresses in composite bars/section, Modular ratio, Equivalent area of a compound section. Primary or Linear strain, Poison's ratio, Shear stress, Principal stresses and strains (for simple cases), Mohr's circle.
Module-3	**Centre of Gravity& Moment of Inertia**	Definition, Methods of finding out centre of gravity of simple figures, Centre of parallel forces. Definition, Important theorems, Calculation of moment of inertia of different shapes and its application, Moment of inertiaof composite sections.
Module-4	**Shear Force and Bending Moments**	Beams shearing force and bending moment, Shear force and Bending moment diagrams for cantilever and simply supported beam, and overhanging beam.
Module-5	**Stresses in Beams**	Simple beams bending, Section modulus, Moment of resistance, Shear stress in section of beam.

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku , "Elementary Structural Analysis".
5. Rama Armarutham S., "Strength of Materials".

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	**5**	**7**	**35**
			TOTAL	**35**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 104, ARCHITECTURAL DRAWING- I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To familiarize with drawing tools and accessories.
- To give a basic knowledge of good drafting and lettering techniques.
- To develop comprehension and visualization of geometrical forms.
- To familiarize with the concept of enlarging and reducing scales.

SECTION – A, ARCHITECTURAL DRAWINGS & MODELS (MANUAL)

Module-1	**Free Hand Drawing and Lettering**	Free hand and mechanical lettering.
Module-2	**Basic Technical Drawing**	Concept and types of line, Division of lines and angles, Drawing polygons, Inscribing and circumscribing circles in polygons, Drawing geometrical curves helix, Conoid etc.
Module-3	**Orthographic Projections**	Definition, Meaning and concept, Planes of Projections, First angle projections, Projection of points, Lines and planes in different positions.
Module-4	**Orthographic Projections**	Projection of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in different positions. Sections of regular rectilinear and circular solids (prisms, pyramids, cones, cylinders, spheres etc.) in varying conditions of sectional plane.
Module-5	**Development of Surfaces**	Development of surfaces of cubes, prisms, cylinders, pyramids, cones and spheres.
Module-6	**Solid Geometry**	Construction of section, Intersection and interpenetration of solid.

REFERENCE BOOKS

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
4. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by AmericanTechnical Society, 1966.
5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Drawing Sheets of Module 1 - 6**	**18**	**1.5**	**27**
2	**Model Making of Module 4 - 6**	**8**	**1**	**8**
			TOTAL	**35**

B. ARCH. SEMESTER – I
RAR – 105, ARTS AND GRAPHICS- I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- Introduction to art and appreciation of art and its philosophies.
- Familiarization with principles and theories of art
- Development of art and graphic skills.

Module-1	**Relevance of Art in Life**	Art, artist, society and religion. Interrelation between Art and Architecture. Introduction of Aesthetics
Module-2	**Colour Theory**	Its psychological and emotional aspect in application
Module-3	**Skill Developing Exercises**	Free hand sketching, Still life drawing, Water colour, crayons, Dry pastels, Pen and Ink. Drawing from observation of nature and live objects.

REFERENCE BOOKS

1. Arnold Dana, “Art History – A Very Short Introduction” , Oxford University Press.
2. Stallabrass, Julian, “Contemporary Art – A Very Short Introduction” , Oxford University Press.

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Quiz of Module – 1 & 2**	**2**	**5**	**10**
2	**Drawing Sheets/Sketches of Module - 3**	**5**	**5**	**25**
			TOTAL	**35**

B. ARCH. SEMESTER – I
RAR – 106, ECOLOGY& ENVIRONMENT

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To inform about the fundamentals related to Ecosystem.
- To develop understanding of the Environment and Environmental issues, their causes and mitigation measures.
- Finally, the application of ecological and environmental principles and guidelines to their architecture/planning projects.

Module-1 Introduction	Definition and origin of ecology, Basic concepts of ecology, Major divisions of ecology, Definition of environment, Interaction among ecological factors – light & temperature, precipitation, humidity, gases/wind, topography. Global warming & climate change, Loss of bio-diversity, Desertification, Deforestation,
Module-2 Ecosystem	Kind of ecosystem, Structure, Function and energy flow of ecosystem. Ecological succession, Ecosystem development, Climax concept.
Module-3 Soil – Edafic Factors	Definition of soil, Formation of soil, Soil profile, Classification, Soil complex, Soil depletion, degradation and conservation, relation of soil and built environment.
Module-4 Water Regimes	Water in nature, Water balance problem, Surface / ground water, Sources of water pollution, Ground water pollution, Marine pollution, Prevention control of pollution, Conservation & management, impact of human intervention on water.
Module-5 Air Pollution	Kinds of air pollution, Sources of air pollutants, Effects – Depletion ofOzone, Acid Rain, Prevention & control of air – pollution, Noise pollution, Effect of human habitat and human activity on atmosphere.
Module-6 Built Environment and Ecology	Understanding the interrelationship between man, nature and built-form (in urban / rural area).

REFERENCE BOOKS

1. Sharma P.D., "Ecology and Environment", Rastogi Publications, Meerut, India.
2. Perlman, D. and Miclder, J., "Practical Ecology for Planners Developers and Citizens", Island Press.
3. Platt, R.H., "The Ecological City: Preserving and Restoring Urban Bio diversity", N.Y.Academy of Sciences.
4. Register, R., "Ecocities: Building cities in balance with Nature", New Society Publishers.
5. Todd, N.J. and Todd, J., "Principles of Ecological Designs", North Atlantic Book.
6. Paolo, S., "Arcology: The City in the Image of Man", Rev. Edn. MIT Press
7. Voula, M., "Sustainable Development, Energy and the city: A Civilization of Concepts and Actions",Elsevier.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Quiz/Sketches of Module – 2 - 6**	**5**	**5**	**25**
2	**Seminar of Module – 1**	**1**	**10**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – I
RAR – 107, COMMUNICATION SKILLS & TECHNIQUES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	1	3 HRS.

OBJECTIVES

- To development in students communicative, writing and presentation skills.
- To enable them to record, report analyzes, evaluate and understand architecture, both in its theoretical and practical form.

Module-1	**Revision**	Sentence, Phrase, Clause and parts of speech -Noun-gender, Number case, Pronoun-personal' reflexive, Emphatic, Demonstrative, Indefinite, Distributive, Reciprocal,Adjective, Article,Preposition,Conjunction and Interjection. Vocabulary, Word building and word formation, Phrases and idioms, Proverbs, Reading a dictionary, Using a thesaurus.
Module-2	**Composition and Comprehension**	Essay, Story and letter writing, Summarizing, Comprehension-unseen passages.
Module-3	**Technical Communication**	Objective, Process, Levels and Flow of communication, Communication networks, Visual aids, Group communications.
Module-4	**Effective Presentation Strategies**	Effective speaking, Types of speaking, Presentation with electronic aids.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford UniversityPress, New Delhi.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module – 1 - 4**	**6**	**5**	**30**
2	**Presentation of Module - 4**	**1**	**5**	**05**
			TOTAL	**35**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – I
RAR – 108, COMPUTERS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Introduction to basic knowledge of computers - operating system, software and hardware.
- To familiarize with software associated with text formatting, spread-sheets and presentation.
- Development of effective presentation techniques.

Module-1 **Introduction**
Introduction to computers and hardware's, General idea about popular operating systems and software, Basics of Internet.

Module-2 **MS Office- MS Word**
Create a document that can be used by previous versions of word, Saving Options.
Create a document -
Open a new document and start typing, Start a document from a template, Delete a document, Add a heading, Adjust the spaces between lines or Paragraphs, Insert a page break, Insert a picture or clip art, Insert or create a table, Headers, Footers, and Page numbers, Create a table of contents, Apply themes to Word documents, Add a cover page.
Read documents in Word -
Read a document, Mark up a document, Find or look up words and phrases, Turn on or off - full screen reading view.

Module-3 **MS Office – MS Excel**
Getting Started with Excel -
Create a workbook, Enter data in a worksheet, Format a worksheet, Format numbers in a worksheet, Print a worksheet, Create an Excel table, Filter data by using an auto filter, Sort data by using an auto filter, Apply conditional formatting, Apply data validation, Create a formula, Use a function in a formula, Chart your data, Create a macro, Create a pivot table report, Activate and use an add-in
Keyboard shortcuts in Excel 2010 -
Keyboard access to the ribbon, CTRL combination shortcut keys, Function keys, Other useful shortcut keys.

Module-4 **MSOffice – MS Power point**
Create a basic PowerPoint presentation -
Name and create a new presentation, Open a presentation, Save a presentation, Insert a new slide, Add, Rearrange and delete slides, Add text to a slide, Apply a template to your presentation, Apply a theme to add color and style to your presentation, Insert a picture or clip art and insert content or insert a screenshot, Add, Change, or Delete shapes, Create a smart art graphic, Add slide numbers, Page numbers, Date and time, Create a hyperlink, Deliver and distribute your presentation, View a slide show and View your speaker notes privately, while delivering a presentation on multiple monitors, Print out a presentation, Tips for creating an effective presentation.

REFERENCE BOOKS

1. "Microsoft Office – 2013".
2. Dr. Paolo Coletti, "Basic Computer Course Book", Free University of Bolzano Bozen.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module – 1 - 3	5	5	25
2	Presentation of Module - 4	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – II
RAR – 201, ARCHITECTURAL DESIGN - II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 HRS.

OBJECTIVES

- Introduction to human activity and spaces required for activities.
- Introduction to basic building components and their dimensions.
- To appreciate the elements in architectural design of single unit built-up structures.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1	**Anthropometrics Studies**	Studies and introduction to human dimensions and functions, Space-activity relationships, Measure drawings of simple living units.
Module-2	**Living Spaces and Building**	Measuring, Drawing and dimensioning of simple building components. Designing for basic functions of human beings, e.g. living, eating, sleeping, cooking etc.
Module-3	**Building Design**	Design of mono-cellular-unit/structure on a level plane, Designing of simple activity spaces, Designing of multiple but simple activity spaces involving primarily horizontal circulation.

SUGGESTED STUDIO EXCERCISES

Small space structures such as Kiosks/Small shops, Milk booths, Bus shelters, Petrol pumps, Gazebo, Florists shop, Entrance gates, Exhibition stalls, ATMs, Chowkidar's hut etc.

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture : Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets.
3. "Neufert Architect's Data", Blackwell Publishing.
4. Donald Watson and Michael J. Crosbie, "Time – Saver Standards for Architectural Design, Technical Data for Professional Practice", McGRAW - HILL.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Design Exercises of Module 1 - 3**	**6**	**10**	**60**
2	**Measured Drawing of Module - 1**	**1**	**10**	**10**
			TOTAL	**70**

B. ARCH. SEMESTER – II
RAR – 202,CONSTRUCTION & MATERIALS – II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To acquaint the students to usage ofbuilding materials such as Timber and Hardware, Damp Proofing Courses and CementConcrete.
- To familiarize the students with construction techniques for use of the above materials in building works.and joinery in carpentry
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	**Timber& Hardware**	Classification, Characteristics, Defects, Preservation. Hinges, Handles, Knobs, Bolts, L-drops, Locks, Stoppers, Stays, Silencers, Chain guards, Closers, Catchers, Knockers etc. in various materials.
Module-2	**D.P.C.**	Asphalt, Bitumen, Synthetic, etc.
Module-3	**Cement Concrete**	Types (Plain & Reinforced), Mixing, Curing, Water Cement Ratio, Qualities and Workability.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit Timber depot/Ready mix concrete plants etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4	**Workshop / Construction Yard Practice**	Practicing in construction yard by making the examples of brick masonry works, Carpentry works etc.
Module-5	**Site Exposure**	Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in masonry and carpentry works.
2. To construct examples of brick masonry works in construction yard.
3. To construct examples of timber joints in workshop and study the various hardware used in doors and windows.
4. To survey construction work on site and submit report

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6	**Brick Work**	Arches in brick and stone, Elementary principles, Centering. Cavity walls.
Module-7	**Foundation**	Need, Design criteria, Foundation concrete, Details of simple spread foundations for load bearing walls of various thicknesses up to two brick thick.
Module-8	**Timber**	Elementary carpentry, Common joints,
Module-9	**Timber**	Details of framed, ledged, braced and batten doors.
Module-10	**D.P.C.**	Horizontal and Vertical D.P.C.

CONSTRUCTION PLATES

1. To understand the terminology of arches and the various type of arches in brick.

2. To understand the application of cavity walls in brick masonry.
3. To understand spread foundation for masonry load bearing walls.
4. To understandvarious types of joints in timber.
5. To understand woodenFramed, Ledged, Braced and Batten Door.
6. To understand horizontal and vertical DPCfor load bearing walls.

APPROACH

- The students would be familiarized with glossary of vernacular terminology as prevalent in this part of the county
- The emphasis will be on construction details as applicable to Indian conditions.
- Site visits to Timber market and Construction sites.
- Knowledge about rates of materials should be given.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – BarryVolume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra&Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Building Materials by SC Rangwala: Charotar Pub. House, Anand
10. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill
11. Publishers, New Delhi, 2011.
12. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
13. National Building Code of India 2005, Bureau of Indian Standards, 2005.
14. Engineering Materials-Deshpande.
15. Engineering Material-Roy Chowdary
16. Designing with models – Criss. B. Mills.
17. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
18. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
19. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
20. Wenninger (Magrus.J.) Spherical Models, Cambridge University Press, 1979

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey&Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – II
RAR – 203, ARCHITECTURAL STRUCTURES -II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES:

- To understand the basic principles of structural mechanics so that it forms the basis for study of structural design.

Module-1	**Stresses in Trusses**	Introduction, Perfect frame, Deficient frame, Redundant frame, Type of supports and their reactions,Analysis of cantilever and simply supported trusses byAnalytical method, Method of sections, Graphical method.
Module-2	**Torsional Stress in circular shaft**	Introduction, Torsion in shafts - Pure torsion, Theory of pure torsion, Torsional moment of resistance, Assumptions in the theory of pure torsion, polar modulus, Power transmitted by a shaft, Torsional rigidity.
Module-3	**Plain Cement Concrete**	Concrete mix, Curing and strength of concrete, Effect of temperature, Shrinkage, Fatigue.
Module-4	**Deflection of Beams (Cantilever and Simply supported)**	Introduction, Calculation of slope and deflection by Double Integration, Macaulay's Method, and Moment area Method. Conjugate beam method.
Module-5	**Column and Struts**	Definition, End conditions, Buckling and critical loads, Slenderness ratio, Various column theories. Stress distribution of the section of an eccentrically loaded rectangular column, the middle third rule, Core or kernel of section (Rectangular and Circular sections).

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku , "Elementary Structural Analysis".
5. Rama Armarutham S., "Strength of Materials".

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	**5**	**7**	**35**
			TOTAL	**35**

B. ARCH. SEMESTER – II
RAR – 204, ARCHITECTURAL DRAWING - II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To familiarize the student with theoretical, practical and pictorial aspects of architectural drawing.
- To develop perception and presentation of simple architectural forms and buildings.
- To develop or upgrade an understanding about AutoCAD 2D, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)

Module-1 Metric Drawing

Introduction, Types, Uses and advantages, Isometric, Axonometric and Pictorial view.
Metric drawing and projection and their dimensioning.
Metric of plane figures composed of straight lines.
Metric of circles.
Metric of simple and complex blocks.

Module-2 Perspective Drawing

Introduction, Purpose and use, Differences with metric projections, Anatomy of a perspective –cone of vision, Station point, Picture plane, Eye level, Horizon line, Ground line, Vanishing point, etc., Types of perspective - One point, Two points, and Three point perspectives.
One Point Perspective - Perspectives of simple and complex box blocks.
One Point Perspective - Perspective of simple curved surface.
One Point Perspective - Perspective of simple household furniture items.
Two Point Perspective - Perspectives of simple and complex box blocks.
Two Point Perspective - Perspective of simple curved surface.
Two Point Perspective - Perspective of simple household furniture items.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)

Module-3 Exploring the Interface

Installation and launching autocad, Using Application menus, Using ribbons, Expanding panels, Understanding flyouts, Pick point in the drawing area, Saving a file and working with multiple files.

Module-4 Creating your First Drawing

Starting from scratch, Understanding paper area, Unit, Scale, Planes, Using the UCS icon, Design templates, Types and use of 2D Drafting tools, Dimensioning, 2D keyboard commands.

Module-5 Organisation of Drawing

2D isometric views, Materials and textures, Reference other drawing files, Link and embed data (OLE), Work with data in other formats and exporting 2D drawings to various software, Extract data from drawings and spread sheets, Access external databases.

Module-6 Effective Presentation

Layer management, Plotting and publishing the drawing in modal space and paper space.

REFERENCE BOOKS

1. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
2. Francis Ching, Architectural Graphics, Van Nostrand Rein Hold Company, New York, 1964.
3. N.D.Bhatt, Elementary Engineering Drawing (Plane and Solid Geometry), Charotar Publishing House, India
4.. George K.Stegman, Harry J.Stegman, Architectural Drafting Printed in USA by AmericanTechnical Society, 1966.

5. C.Leslie Martin, Architectural Graphics, The Macmillan Company, New York, 1964
6. Introducing AutoCAD and AutoCAD LT - GeorgeOmura
7. Mastering AutoCAD - GeorgeOmura
8. AutoCAD 2013 and AutoCAD LT 2013 "BIBLE" - Ellen Finkelstein

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Drawing Sheets			
a	of Module – 1	5	1.5	7.5
b	of Module – 2	7	2.5	17.5
2	Computer Lab of Module 3 - 6	4	2.5	10
			TOTAL	35

B. ARCH. SEMESTER – II
RAR – 205,ARTS AND GRAPHICS - II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- Introduction to art and appreciation of art and its philosophies.
- Familiarization with principles and theories and graphic and architectural composition
- Development of art and graphic skills.

SECTION – A, ARTS AND GRAPHICS

Module-1	**Philosophy of Art**	Philosophy of western Art movement and their contribution to architecture Renaissance - Leonardo da Vinci, Michael Angelo Impressionism – Monet, Van Gough Cubism – Picasso, Henry Moore.
Module-2	**Theory of Design**	Unity, Order, Proportion, Form and Shape, Solids and Voids. Aspects of Unity- Contrast, Emphasis, Harmony, Rhythm, Vitality.
Module-3	**Free hand drawing and Rendering Techniques**	Exercises to learn proportion, comprehension of scale related to complete sense of composition Drawings of human activity with back ground environment and activity areas.

SECTION – B, PHOTOGRAPHY

Module-4	**Introduction to Photography**	Development of photography, Historical background, Different types of cameras.
Module-5	**Photography Techniques**	Lighting techniques, Digital photography with DSLR.

LIST OF ASSIGNMENTS (Field Exercises &Drawings)

1. To understand the techniques of photographing various subjects - Landscape, Portrait, and Building etc.

REFERENCE BOOKS

1. Arnold Dana, "Art History – A Very Short Introduction" , Oxford University Press.
2. Stallabrass, Julian, "Contemporary Art – A Very Short Introduction" , Oxford University

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Drawing Sheets/Sketches of Module - 3**	**4**	**5**	**20**
2	**Tutorial/Quiz/Sketches of Module - 1 & 2**	**4**	**2.5**	**10**
3	**Photograph & Tutorial of Module– 4 & 5**	**2**	**2.5**	**05**
			TOTAL	**35**

B. ARCH. SEMESTER – II
RAR – 206, SURVEYING

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	1	3 HRS.

OBJECTIVES

- To develop knowledge and skills related to surveying and levelling principles and practice.

Module-1 Introduction	Definition, classification, principles of surveying, Units of measurement, Scale, Signs convention.
Module-2 Chain Survey	Instruments used, Types of chain, Instruments for ranging, Setting out angles, Erecting perpendiculars, Selection of station, Methods of taking offset and Obstacles in chaining.
Module-3 Plane Table Survey	Plane table and accessories, Methods of plane table survey, Radiation, Intersection, Traversing and resection.
Module-4 Compass Survey	The prismatic compass, Surveyor compass and its construction and **u**ses, Reduced and whole circle bearing, Magnetic declination, Effect of local attraction.
Module-5 Levelling&Contouring	Definition, Types of level, Booking and reduction of levels, Profile & cross section leveling, Errors in leveling. Characteristics of contours, Direct and indirect methods of contouring, Interpolation, Uses of contours, Calculation of area & volume.
Module-6 Theodolite	Study of instruments, Definition of different terms, Temporary adjustments, Uses, Measuring horizontal and vertical angles, Method of repetition, Extension of lines.

LIST OF ASSIGNMENTS (Field Exercises & Drawings)

1. To find out horizontal distance between two points and plotting the details on lateral side of chain line using chain, tape, ranging rod & cross staff etc.
2. Two point problem & three point problem.
3. Making L-section & Cross section of a profile.
4. Making grids on ground using theodolite & taking spot level &drawing contour lines.
5. Making a regular polygon in field and finding error of closure using different equipment.

REFERENCE BOOKS

1. Surveying Volume I & II by Dr. B.C. Punmia
2. Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
3. Surveying Volume -1 by Dr. K.R.Arora.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 6**	**5**	**5**	**25**
2	**Surveying Lab of Module 2 - 6**	**4**	**2.5**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – II
RAR – 207, HISTORY OF ARCHITECTURE – I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To inform about the development of architecture in the ancient western world and the cultural and contextual determinants that produced that architecture.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To gain knowledge of the development of architectural form with reference to technology, style and character in the prehistoric world and in ancient Egypt, West Asia, Greece and Rome.

Module-1	**Prehistoric Age**	Introducing concepts of culture and civilization - Paleolithic and Neolithic culture - art forms and evolution of shelter - megaliths - agricultural revolution and its impact on culture and civilization with examples from Carnac and Stonehenge.
Module-2	**Birth of Civilization**	In reference to the Asia-minor region with nascent cities like Jericho, Catalhoyuk, and Hattasus etc.
Module-3	**Ancient River Valley Civilizations: Egypt**	Landscape and culture of Ancient Egypt- history - religious and funerary beliefs and practices - monumentality tomb architecture: evolution of the pyramid from the mastaba – Great Pyramid of Cheops, Gizeh etc. Temple architecture: mortuary temples and cult temples - Temple of Ammon Ra, Karnak, Khons - Temple of Abu Simbel (Rock Cut) etc.
Module-4	**Ancient River Valley Civilizations: Mesopotamia**	Urbanization in the fertile crescent - Sumerian, Babylonian, Assyrian and Persian culture, Evolution of city-states and their character, law and writing , theocracy and architecture - Ninveh, Khorsahbad, Marie, Babylon etc. Evolution of the ziggurat - Ziggurat of Ur, Urnamu etc., Evolution of the palaces - Palace of Sargon, Khorsabad - Palace at Persepolis.
Module-5	**Ancient Civilizations: Aegean**	With reference to cities in Aegean like Troy, Sparta, Mycenae, which formed the basic of Greek civilization?
Module-6	**Classicial Period: Greece**	Orders in architecture: Doric, Ionic, Corinthian - optical illusions in architecture, Domestic architecture; Public Buildings: Agora, Stoas, Theaters, Bouletrion and Stadias. Greek temple: evolution and classification- Parthenon and Erecthion, Geometry and symmetry of individual buildings and their relationship with others based on different organizing principles and conditions of site.
Module-7	**Classical Period: Rome**	Roman history: Republic and Empire- Roman religion and the Roman temple- Roman character- lifestyle, Roman urban planning- art and architecture as imperial propaganda: forums and basilicas. Orders in architecture: Tuscan and Composite, Domestic architecture – structural forms, materials and techniques of construction. Rome: Forum Romanum and other Imperial forums, Enclosure and manipulation of space: Pantheon- Public buildings: Colloseum, Circus Maximus, Thermae of Caraculla.

REFERENCE BOOKS

1. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; CraftsmanHouse; 1994
4. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,
5. Inc.Pub., New York, 1972.
6. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,

7. London, 1986.
8. Gosta,E.Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
9. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
10. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheets/Sketches of Module 1 - 7	7	3	21
2	Tutorial/Quiz of Module 1 - 7	3	3	9
3	Seminar	1	5	5
			TOTAL	35

B. ARCH. SEMESTER – II
RAR – 208, RESEARCH / SEMINAR / WORKSHOP - I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.

Module-1	**Introduction**	Importance of architectural research and writing.
Module-2	**Technical Writing**	Language, Impersonal and formal language, Elements of style, Techniques.
Module-3	**Book Reviews**	Basics of reviewing a book.

LIST OF ASSIGNMENTS

1. Review of an architectural book/books prescribed by subject teacher.
2. Report and presentation on ongoing architectural project.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, “Technical Communications – Principles and Practices”, Oxford UniversityPress, New Delhi.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 2**	**3**	**5**	**15**
2	**Tutorial of Module - 3**	**1**	**20**	**20**
			TOTAL	**35**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – III
RAR – 301, ARCHITECTURAL DESIGN - III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 + 3 HRS.

OBJECTIVES

- To familiarize students with a simple residential unit.
- Utilize varying methods for developing out of the box creative skills for design of small projects.
- Comprehension of arrangement /organization of spatially/ functionally similar units resulting in varied outdoor spaces.
- To assimilate the modifying spatial qualities of indoor & outdoor spaces due to varying configurations.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 Study — Lectures on Elements of Space making like Floor, Wall, Door, Window, Column, Stairs, Roofs etc.

Module -2 Learning — Lectures on interpreting spatial configuration for specific design programme. Configuration / array of multiple repetitive units organized on basis of functional, geometric and visual order.

Module-3 Design — Of simple buildings with multiple use, utilizing lessons from space-making and lateral thinking exercises. Understand Grouping of simple buildings integrating transforming spatial qualities of indoor and outdoor spaces.

SUGGESTED STUDIO EXCERCISES

1. Space making exercises with varying configurations of elements like colums, walls, floors, etc
2. Design of buildings like Residence, PanchayatBhawan, Ashrams, Artist Studio, Office cum Houses, Tourist Bungalows, club or similar projects.

REFERENCE BOOKS

1. Ching, Francis D.K. Form Space & Order.
2. Rasmeussen. E. Experiencing Architecture.
3. Zevi, Bruno.Space Time and Architecture.
4. Pandya, Yatin. Elements of Space-making.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Drawing Sheets of Module - 1**	**2**	**5**	**10**
2	**Drawing Sheets of Module - 2**	**1**	**10**	**10**
3	**Design Exercises (Minor) of Module 3**	**1**	**15**	**15**
4	**Design Exercises (Major) of Module 3**	**1**	**35**	**35**
			TOTAL	**70**

B. ARCH. SEMESTER – III
RAR – 302, CONSTRUCTION & MATERIALS – III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To acquaint the students to usage of building materials such as Variety of Stone, Surface finishing, Painting and Polishing& Roof coverings (conventional).
- ` To familiarize the students with construction techniques for use of the above materials in building works.
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Stone — Classification, Availability, Characteristics and Uses.

Module-2 Surface (Wall)Finishing&Painting and Polishing — Types and application of Plasters, Jointing and Pointing, Cladding. Preparation of variety of surfaces, Application of various coats. Finishes – Lime / Colour wash, Dry distemper, Oil bound distemper, Cement paints, Acrylic emulsions, Synthetic enamels, Wall textures etc. Polishes and Varnishes.

Module-3 Roof Coverings (Conventional) — Clay Tiles (Country, Allahabad, Mangalore tiles etc.), Stone Slating, Shingles, Thatch.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit stone quarries and glass, ceramic, paints etc. factoriesfor better understanding and submit report.
3. To construct examples of brick& stone masonry works in construction yard.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice — Practicing in construction yard by making the examples of stone masonry works, plastering, jointing, pointing and painting,timbering of shallow trenchesand doorsamples

Module-5 Site Exposure — Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in stone masonry finishing works.
2. To study the various tools, equipments used in glass works.
3. To study the various tools, equipments used in painting works.
4. To prepare scaled model of door in workshop.
5. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Stone Work — Elementary Stone Masonry, Types of joints. Random, Course and Ashlar Stone Work in walls.

Module-7 Door (Timber) — Types and details of Panelled door shutters and Mosquito proof doorshutter.

Module-8 Window / Ventilator (Timber) — Types of Windows / Ventilators and details of glazed window and ventilator shutters and frames.

Module-9 Roof Terracing — Complete process of laying of terracing with provisioning of Gola & Khurra etc. - Lime concrete, Mud phaska with brick tiles, Brick coba.

Module-10 Temporary Timbering — Timbering of shallow trenches.

CONSTRUCTION PLATES

1. To understand square stopped ends of Random, Course and Ashlar stone masonry.
2. To understand variety of Panelled door shutters and their details in timber.
3. To understand Mosquito proof door shutter and its details in timber and jaali.
4. To understand variety of windows & ventilators and the details of window frame and glazed shutter in timber and glass.
5. To understand the application of roof terracing with various details.
6. To understand Timbering of shallow trenches in various soil types.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian climatic conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
4. The Construction of Buildings – Barry Volume I, II, III and IV
5. Chudley, Roy, "Construction Technology", Longman, 2005.
6. Building Construction_Mitchell (Elementary and Advanced)
7. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
8. Building Construction-Bindra&Arora.
9. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
10. Mitchell's Structure & Fabric-II
11. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
12. Building Materials by SC Rangwala: Charotar Pub. House, Anand
13. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
14. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
15. National Building Code of India (Latest Edition), Bureau of Indian Standards.
16. Engineering Materials-Deshpande.
17. Engineering Material-Roy Chowdary
18. Designing with models – Criss. B. Mills.
19. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
20. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
21. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey&Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – III
RAR – 303, ARCHITECTURAL STRUCTURES - III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES:

- To understand the analysis of indeterminate structures and their application in structural design and analysis.

Module-1	**Elastic Theorems & Energy Principles and its Application in Simple Cases.**	Introduction, Strain energy stored due to axial loading and due to bending, Law of reciprocal deflections, Betti's law, The first theorem of Castiglione, The second theorem of castigliano (Introduction only).
Module-2	**Statically Indeterminate Structures**	Introduction, Degree of indeterminacy, External and internal indeterminacy, Calculation of degree of indeterminacy for beams and frames.
Module-3	**Fixed & Continuous Beams**	Fixed beams - Introduction, B.M. Diagram for a fixed beam for various loading, Effects of sinking of support, advantages and disadvantages of fixed beams. Continuous beams - Introduction, Clapeyron's theorem of three moments for two to three span of continuous beam, Effects of sinking of support.
Module-4	**Moment Distribution Method**	Basic Proposition, Relative stiffness, Analysis of continuous beams and portal frames for simple loading.
Module-5	**Slope Deflection Method**	Introduction, Basic concepts, Basic formulae, Application to analyse Continuous beams and Portal frames for simple loadings.

REFERENCE BOOKS

1. Nautiyal B. D., "Introduction to Structural Analysis", B.H.U.
2. Punmia P. C., "Strength of Materials & Mechanics of Structures".
3. Khurmi R. S., "Strength of Materials".
4. Senol Utku , "Elementary Structural Analysis".
5. Rama Armarutham S., "Strength of Materials".
6. C.K. Wang, "Theory of Structures".
7. Ramamrutham.S, Narayan. R, "Theory of Structures".

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	**5**	**7**	**35**
			TOTAL	**35**

B. ARCH. SEMESTER – III
RAR – 304, ARCHITECTURAL DRAWING - III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To develop greater perception of complex Architectural forms and buildings.
- To develop the skill of making perspectives of complex buildings and Rendering them in different media.
- To develop or upgrade an understanding about AutoCAD 3D, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)

Module-1 Shades and Shadows
Values in Shades and shadows.
Constructing plan shadows (point, line and plane).
Constructing shadows in elevations (point, line and plane).
Short –cut methods for Constructing shadows.
Presentation techniques in Sciography.

Module-2 Presentation
Introduction to different textures and finishes in plan and elevation.
Graphical representation of furniture, automobiles, human figure etc. in plans and elevation and 3-Dimension.
Preparation of presentationdrawings of small buildings, through Plans, Elevation, Section, Site plan etc., using various rendering techniques and media, incorporating sciography for creating three dimensioned effect.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)

Module-3 Introduction to 3D Using SketchUp
How to get around inside SketchUp. Navigation tools - Zoom, pan and rotate. Understanding the XYZ axis. Selecting toolbars. Applying templates. Drawing and using the pencil tool. Drawing basic geometric shapes. Drawing with measurements. Drawing circles and arcs. Importing into SketchUp.

Module-4 Modelling & Editing 3D Models
Modelling techniques: Using Push Pull. Using Follow Me. Intersecting Geometry. Editing techniques: move / copy. Simple Array techniques. Rotating objects. Rotate / copy Scale fractional and relative. Making components. Making groups. Comparisons and benefits. Saving components. Re-loading components. Accessing the digital warehouse. Introduction to Plugins.

Module-5 Understanding Material Editing
Getting to understand the Materials Editor. Positioning textures. Limits to graphics and bitmaps. Paint bucket. Materials Editor. Textures and bitmaps. Positioning textures. Limits to graphics and bitmaps.

Module-6 Introduction to Animation
Create new scenes. Create new styles. Saving scenes and styles. Exporting 2D images or 3D models. Creating Walkthroughs.

REFERENCE BOOKS

1. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
2. Francis Ching, Architectural Graphics, Van Nostrand and Reinhold Company, NY 1975
3. IH. Morris, Geometrical Drawing for Art Students - Orient Longman, Madras, 2004.
4. Google SketchUp Pro 8 Step by Step - João Gaspar.
5. Architectural Design with SketchUp: 3D Modeling, Extensions, BIM, Rendering, Making, and Scripting - Alexander C. Schreyer

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Drawing Sheets			
a	of Module - 1	5	2	10
b	of Module - 2	6	2.5	15
2	Computer Lab of Module 3, 4, 5 & 6	4	2.5	10
			TOTAL	35

B. ARCH. SEMESTER – III
RAR – 305, ARTS AND GRAPHICS - III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To develop an appreciation of Indian Arts & Crafts among the Students.
- To strengthen the skill of architectural rendering.
- To develop the skills to design smaller elements of building.

SECTION – A, ARTS AND GRAPHICS

Module-1 **History of Indian Art** A brief introduction to the History of Indian Art,
Module-2 **Techniques& Mediums of Art** Learing of wood cut, Lino cut, Serigraphy (Screen printing).
Module-3 **Design of objects** Designing small scale models of window grill, railing and balustrades, jaali in suitable materials (Steel, Concrete etc.)

REFERENCE BOOKS

1. ABC of Indian Art- J.F.BLACKER.
2. A concise History of Indian Art - ROY C. CRAVEN.
3. Maurya and Post Maurya Art- NIHAR RANJAN RAY
4. The Story of Indian Art- S.K. Bhattacharya

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Quiz of Module - 1**	**1**	**5**	**05**
2	**Drawing Sheets/Prints of Module - 2**	**2**	**10**	**20**
3	**Design & Model of Module – 3**	**2**	**5**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – III
RAR – 306, ARCHITECTURAL SERVICES – I (WATER SUPPLY & SANITATION)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To understand the basic principles of water supply and sanitation.
- To make them enable to draw the piping system (pipe above ground and underground) for different types of buildings.
- To familiarize the student with plumbing bye laws as per BIS.

SECTION – A, WATER SUPPLY

Module-1 Water Supply

Need to protect water supply,Requirements of water supply to different types of buildings.
Sources of water supply, Quantity and quality of water.
Conveyance and distribution of water, Overhead tank,Underground tanks,Pipe appurtenances.
Hot and cold water supply system in a low rise and high rise buildings. Distribution system in campus, Pipes their size, Jointing and different fittings.

SECTION – B, SANITATION

Module-2 Sanitary Engineering

Purpose and principles of sanitation, Collection and conveyance of waste matter.
Quantity and Quality of refuse, Design and construction of sewer's and sewer appurtenances.
Garbage and sewage disposal.
Roof and surface water drainage. Rain water storage and water harvesting principles and methods.
Sanitary appliances, Traps their variety, Pipes and joints, Sanitary pipes works below and above ground level.

SECTION – C, APPLICATION

Module-3 Plumbing & Sanitary Drawing

The plumbing and sanitary system for individual spaces e.g.kitchen, toilet, wash area, utility etc.
The plumbing and sanitary system for aresidence.

REFERENCE BOOKS

1. National Building Codeof India.
2. The construction of building by Barry-vol.-5.
3. Water supply and Sanitation by Charanjit Shah.
4. Water supply & sanitary Engineering by S.C.Rangawala.
5. Water supply & sanitary Engineering by S. K.Hussain.

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Sheets of Module - 3 (Service Drawings/Sketches)**	**2**	**7**	**14**

2	**Tutorial of Module – 1, 2 & 3**	**3**	**7**	**21**
			TOTAL	**35**

B. ARCH. SEMESTER – III
RAR – 307, HISTORY OF ARCHITECTURE – II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To inform about the development of Indian architecture and its contextual and traditional aspects.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion and climate
- To gain knowledge of the development of architectural form with reference to technology, style and character in various aspects of Hindu architecture.
- To comprehend and analyze spatial character, scale, and structure through historical and traditional built heritage.
- To comprehend and relate to the theoretical basis of historical and traditional Hindu architecture.

Module-1	**Indus Valleycivilization**	Town planning principles, cultural ethos, economy exemplified with examples from Mohenjodaro and Harappa.
Module-2	**The Aryan civilization**	With its emphasis on the Vedic town plan, its motifs and patterns. The brick altars and their significance.
Module-3	**Buddhist Architecture**	Typology of lats, eddicts, stupas, viharas, and chaityas, both in rock-cut or otherwise. The techniques used for rock-cut spaces and free standing built masses. The spatial and functional connotations.
Module-4	**Buddhist Theory**	The Buddhist philosophy and its imprint in built space.
Module-5	**Hindu Architecture-Indo-Aryan**	The evolution of the temple form, evolution of the shikhara in north India. The three schools of architecture—the Gujarat, the Khajuraho, and the Orrisan styles. Comparison in spatial attributes, scale and detail.
Module-6	**Hindu Architecture-Dravidian**	The evolution of the vimana and the contributions of the Chalukyas, the Pallavas, the Pandyas and the Cholas. The contributions of the Nayaks to the temple cities. The city morphology, spatial diversity and planning criteria.
Module-7	**Hindu Theory**	Hindu philosophy and its imprint in temples/traditional houses and other built structures. Mandala and the geometric grid in temple plans. The proportional theory in temple elevation.
Module-8	**Jain Architecture**	The temple cities of Palitana, Mount Abu and Girnar.
Module-9	**Jain Theory**	The Jain philosophy and its imprint in built form. The Jain mandalas.
Module-10	**Measured Drawing**	Measured Drawing of a historical precinct.

REFERENCE BOOKS

1. Stella Kramrisch, The Hindu temple, Volume 1 & 2, Motilal Banarsidass Publications, 1996.
2. Percy Brown, Indian Architecture (Buddhist and Hindu period), D.B.Taraporewala Sons & co Pvt. Ltd. 1965
3. Volwahsen, Andreas, Living Architecture
4. Satish Grover, The Architecture of India- Volume 2, Vikas, 1980.
5. Henri Stierlin, Anne Stierlin, Hindu India: from Khajuraho to the temple city of Madurai, Taschen, 1998.
6. James Fergusson, History of Indian & Eastern Architecture, 2007
7. C. Batley, Design Development of Indian Architecture, John murray, London, 1934.
8. A. Cunningham, Archaelogical Survey of India, Vol. I – XXIII, Simla, Calcutta, 1903-30.
9. M. Edwards, Indian temples & Palaces, Paul Hamlyn, London.
10. Christopher Tadgell, Indian & South Asia: The Buddhist & Hindu Tradition, Ellipses, 1998.
11. Surendra sahai, Indian architecture, Prakash books, 2006.
12. Ernest Binfield Havell, Indian Architecture, J. Murray, 1913.

13. Benjamin Rowland, The Art & Architecture of India: Buddhist, hindu, jain. Penguin books, 1953.
14. K.V,Soundra Rajan, Indian Temple Styles: the personality of Hindu Architecture.
15. Giles Henry Rupert Tillotson (ed.), Paradigms of Indian architecture: Space & Time in Representation & Design, Psychology Press, 1998.
16. Adam hardy, Indian temple Architecture- form & transformation, Abhivav Publications, 1995.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheets/Sketches of Module 1 - 9	6	2.5	15
2	Tutorial/Quiz of Module 1 - 9	3	2.5	7.5
3	Seminar	1	5	5
4	Measured Drawing& Model of Module - 10	1	7.5	7.5
			TOTAL	35

B. ARCH. SEMESTER – III
RAR – 308, RESEARCH / SEMINAR / WORKSHOP - II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.

Module-1 **Introduction** Aspects of Analysis of an Architectural project
Module-2 **Technical Writing** Critical Appreciation of a Project: Analyzing on the basis of site, Built Form and Space, Spatial Organization, Materials and Techniques, Elements and Special Characteristics, Activity Pattern.
Module-3 **Book Reviews** Review of Book with presentation of the précis.

LIST OF ASSIGNMENTS

1. Review of an architectural book/books prescribed by subject teacher.
2. Report and presentation on ongoing architectural project.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford UniversityPress, New Delhi.
2. Fundamentals of Design

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 1**	**1**	**5**	**5**
2	**Tutorial of Module - 2**	**3**	**5**	**15**
3	**Tutorial of Module - 3**	**1**	**15**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER – III
RAR – 309, CLIMATOLOGY

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- Acquainting the students with human thermal comfort as an essential function of a building, its analysis & use in Architecture.
- To familiarize students with the elements constituting climate and their role in creating responsive designs.
- Understanding the characteristics of varied tropical climates and expected responses of buildings in specific climate types
- To utilize existing traditional/vernacular/ historical structures in the city as case study to learn the various attributes of climate & the desirable responses.

Module-1	**Introduction to climate**	Importance of climate in architecture. Factors affecting climate. Elements of climate: solar radiation, temperature, wind, humidity & precipitation and their measurement.
Module-2	**Climate types**	Climate types all over the world. Tropical climate: climate zones, their charecteristics& responses of the traditional/ vernacular. Micro Climate & Site Climate.
Module-3	**Human thermal comfort**	Study of body's heat production & heat loss, comfort zone, bio-climatic chart, effective temperature isopleths etc. Various models of Thermal Comfort: Static &Adaptive Mode, thermal indices & their applicability.
Module-4	**Solar chart**	Understanding the solar position of a place, azimuth, altitude, incidence, using shadow angle protractor for designing shading devices.
Module-5	**Daylight**	Natural lighting, glare, day light factor & factors affectingday-lighting in various space types, principles of day-lighting in tropics.
Module-6	**Ventilation & Air Movement**	Requirement, size & position of openings, Air-flow pattern inside &outside buildings.
Module-7	**Orientation**	Orientation of buildings in relation to sun & wind.

LIST OF ASSIGNMENTS (Field Exercises & Drawings)

1. Understanding tools & instruments utilized for measurement of climatic elements using the climatology lab & meteorological department.
2. Documenting local case studies of vernacular/ traditional/ historical buildings for understanding their responses to prevailing climate.
3. Collecting data of temperature, humidity, radiation light & wind for specific cities and making solar charts, bio-climatic charts & Mahoney tables for the same.

REFERENCE BOOKS

1. Koinesberger,O. Tropical climate.
2. Krishan, Arvind. Climate Responsive Architecture.
2. Brown, G.Z. Sun Wind & Light.
3. Olgyay, V. design with Climate.
4. Yeang, Ken. Designing with Nature: The Ecological basis for Architecture Design.

5. Works of Architects like HasanFathy, B.V. Doshi, Charles Correa, Ken Yeang, Sanjy Puri, among others to understand responses of varied designers to the existing environment.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial &Lab of Module - 1	2	5	10
2	Seminar / Presentation of Module - 2	1	5	5
3	Drawing Sheets / Presentation of Module –3 - 7	4	5	20
			TOTAL	35

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B. ARCH. SEMESTER – IV
RAR – 401, ARCHITECTURAL DESIGN - IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	5	30	70	**100**	75	25	**100**	**200**	6	6 + 3 HRS.

OBJECTIVES

- To understand the role of climate and environment as a context in shaping building design.
- To comprehend the interpretation of prescribed environmental directions / norms for a given place in building forms.
- Studying the vernacular architecture of varied climatic zones to examine their response to the existing conditions.
- Analysing the spatially rich vernacular architecture especially of the indian subcontinent to derive useful learnings for prevailing climate & region.
- The design studio should be linked with the simultaneous theory subject of vernacular architecture.
- Recognizing the relevant materials & building techniques suitable for that region & explore their applicability in design.
- Learn building on sloping sites or with unique topography.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1	**Understanding climatic zones**	Lecture on the varied climate zones especially in the Indian sub-continent including examples of environment responsive designs. Establishing design criteria for various climate types.
Module-2	**Lessons from Vernacular**	Lectures on concept of vernacular & lessons to be learnt. Detailed study of a vernacular settlement remarkable for its spatial quality, material, and construction technology, characteristic for that region & climate. Analysis of the selected settlement in light of their spatial roles, human scale, activity, space & form and consequently the design considerations. Lectures on the spatial attributes of the resultant open & built of the vernacular and lessons to be learnt from the study & their juxtaposition.
Module-3	**Design of climate responsive buildings**	Designing a multi-functional building in a typical climate zone utilizing the developed design criteria.
Module-4	**Design on sloping site**	Design exercise on sloping terrain with specific orientation & climatic conditions.

SUGGESTED STUDIO EXCERCISES

1. Studies of various climates; responses of vernacular/ traditional in those conditions& establishing design criteria.
2. Study tours to relevant rural/urban destinations for primary documentation.
3. Design of multi-functional building like Motels, Hostels, schools, Tourist Resort, Ashrams.
4. Design on sloping site with unique topography for structures like a simple guest house, tourist complex or museums.

REFERENCE BOOKS

1. Krishan, Arvind Climate Responsive Architecture.
2. Brown, G.Z. Sun Wind & Light.
3. Olgyay, V. Design with Climate.
4. Yeang, Ken. Designing with Nature: The Ecological basis for Architecture Design.
5. Works of Architects like HasanFathy, B.V. Doshi, Charles Correa, Ken Yeang, among others to understand responses of varied designers to the existing environment.

6. Rappoport, Amos. House Form & Culture
7. Oliver, Paul. Shelter & Form
8. Oliver, Paul. Encyclopedia on Vernacular Architecture.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Seminar / Presentation of Module - 1	1	10	10
2	Drawing Sheets& Model of Module - 2	1	15	15
3	Design Exercises (Minor) of Module - 4	1	15	15
4	Design Exercises (Major) of Module - 3	1	30	30
			TOTAL	70

B. ARCH. SEMESTER – IV
RAR – 402, CONSTRUCTION & MATERIALS – IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To acquaint the students tousage of building materials such as Timber products, Glass, Ceramics and Adhesives.
- To familiarize the students with construction techniques for use of the above materials in building works.
- To familiarize the student with the basic building construction practices on site/yard.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Timber Products — Variety of Plywood, Ply-board, Block board, Particle board, Wood wool cement board, Fiberboard, Compressed straw board, Cement fiberboard, Mineral fiber board, Veneers, Laminates etc.

Module-2 Glass & Ceramics — Glass - Translucent, Transparent and Special glasses, Glass bricks. Patch fittings for glazed partitions and shutters.
Ceramics - Terracotta, Faience, Fireclay, Stoneware, Earthware, Vitreous China, Porcelain.

Module-3 Adhesives — Natural Adhesives – Animal, Casein, Bituminous.
Thermoplastic Adhesives – Polyvinyl Acetate.
Thermosetting Adhesives & Plastics - Urea Formaldehyde, Phenol Formaldehyde, Melamine Formaldehyde, Resorcinol Formaldehyde, Epoxide Resins.
Rubber Adhesive.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit timber products,adhesives factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice — Practicing in construction yard / workshop by making the examples of partitions and paneling samples.

Module-5 Site Exposure — Exposure to building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in roof laying works.
2. To construct examples of partition and panelling in construction yard / workshop.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Door (Timber Products) — Types and details of Flush door shutter with finishes.

Module-7 Door (Operational Mechanism) — Complete understanding of operational mechanism (automatic and manual) of variety of Sliding door shutters, Sliding-folding door shutters and Revolving doors shutters.

Module-8 Partition — Terminology, Partitioning methods with use of different materials e.g. Timber and Timber Products, Clay and Terracotta Brick / Block, Pre-cast

		Concrete Block, Wood Wool Cement Board, Compressed Straw Board, Glass and Glass Brick.
Module-9	**Panelling (Timber & Timber Products)**	Terminology, Panelling methods with use of materials e.g. Timber and variety of timber products.
Module-10	**Brick Work Temporary Constructions**	Shoring (Raking, Flying and Needle). Underpinning.

CONSTRUCTION PLATES

1. To understand the application of variety of flush door shutters and their details.
2. To understand the application of variety of sliding door shutters and their details.
3. To understand the application of variety of sliding folding door shutters and their details.
4. To understand the application of partitions in buildinginteriors with using timber, timber products and glass etc. along with their details.
5. To understand the application of panelling in building interiors with using timber and timber products along with their details.
6. To understand the application of temporary construction in buildings.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., “Building Construction Volume I, II, III and IV”, Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, “Building Construction Illustrated”, Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, “Construction Technology”, Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., “Building Construction”, Charotar Publishing House, 2007
7. Building Construction-Bindra &Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell’s Structure & Fabric-II
10. Principle & Practices of Heavy Construction: Smith & Andres
11. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
12. Building Materials by SC Rangwala: Charotar Pub. House, Anand
13. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
14. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
15. National Building Code of India (Latest Edition), Bureau of Indian Standards.
16. Engineering Materials-Deshpande.
17. Engineering Material-Roy Chowdary
18. Designing with models – Criss. B. Mills.
19. Morris, M., “Architecture and the Miniature: Models”, John Wiley and Sons, 2000.
20. Mills, Criss B., “Designing with Models: A Studio Guide to Making and Using Architectural Models”, Thomson and Wadsworth, 2000.
21. Raghuwanshi, B.S., “A Course in Workshop Technology - Vol. I and II”, Dhanpat Rai and Co, 2001.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Construction Sheets/Plates of Module 6 – 10**	**6**	**4**	**24**
2	**Tutorial/Quiz/Sketches of Module 1 – 5**	**2**	**3**	**6**
3	**Market Survey&Seminar of Module 1 – 3**	**1**	**10**	**10**
4	**Workshop/Yard of Module 4**	**1**	**4**	**4**

5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – IV
RAR – 403, ARCHITECTURAL STRUCTURES - IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES:

- To understand the basic principles of R.C.C. structures and soil mechanics and their application in structural design and analysis by **LIMIT STATEMETHOD**.

Module-1	**Introduction to Design Methods**	Introduction, Working stress design, Ultimate load design, Limit state design, Limit state design versus Working stress design. Building code.
Module-2	**Introduction (Limit state design method)**	Understanding of Limit state, Characteristic strength and characteristic load, Design values, Partial safety factors, Factored loads, Stress strain relationship for concrete and steel, Yield stress, Provisions of IS codes, Loads and Load combination
Module-3	**Detailing of Reinforcement**	Introduction, Requirements of good detailing, Nominal cover to reinforcement, Spacing of reinforcement, Reinforcement requirements, Reinforcement splicing, Anchoring reinforcing bars in flexure, Curtailment of tension reinforcement in flexural members, Bar bending schedule.
Module-4	**Analysis & Design of Singly & Doubly Reinforced Rectangular sections and Flanged Beams section**	Introduction, Bending of beam assumption, Moment of resistance, Modes of failure, Maximum depth of neutral axis, Limiting values of tension steel & moment of resistance.
Module-5	**Shear and Development Length**	Introduction, Shear stress, Diagonal tension, Shear reinforcement, spacing of shear reinforcement, Development length, Anchorage bond, Flexural bond.

REFERENCE BOOKS

1. Ashok kumar jain “Reinforced concrete” Limit State design.
2. Punmia P. C., “Strength of Materials & Mechanics of Structures”.
3. Khurmi R. S., “Strength of Materials”.
4. Senol Utku , “Elementary Structural Analysis”.
5. Rama Armarutham S., “Strength of Materials”.
6. M.L. Gambhir, “Fundamentals of Reinforced Concrete Design”.
7. P.C. Varghese., “Advanced Reinforced Concrete Design”.
8. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C.Designs”

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	7	35
			TOTAL	35

B. ARCH. SEMESTER – IV
RAR – 404, ARCHITECTURAL DRAWING - IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	2	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To develop greater perception of complex Architectural forms and buildings.
- To develop the skill of making perspectives of complex buildings and Rendering them in different media.
- To develop the skills free hand sketching.
- To develop or upgrade an understanding about Autodesk Revit Architecture, as an important tool for drafting, designing, analyzing and representation of the drawings in a desired manner.

SECTION – A, ARCHITECTURAL DRAWING (MANUAL)

Module-1 Sciography
Shades and Shadows of objects and building elements cast on irregular surfaces, rendered in suitable medium.
Shades and shadows in perspective views for exteriors.
Shades and Shadows cast by point source of light in interiors.

Module-2 Perspective Drawing
Two-point exterior perspective views, using measure point method, of simple & medium sized buildings- isolated or in-group, showing shades and shadow using different media like-Pencil, Pen-Ink, Water Colour, Poster, and Airbrush etc.
One point perspective drawing of interiors rendered in different media.
Two point perspective drawing of interiors rendered in different media.
Introduction to short cut methods in perspective drawing.
Free hand perspective.
Other innovative methods of perspective presentation techniques should be encouraged.

SECTION – B, ARCHITECTURAL DRAWING (COMPUTER)

Module-3 Getting Started Revit Architecture
Introduction, Modifying the view, Common tasks, System options, File locations, Spelling options, Settings, Keyboard shortcuts, Levels and grids, Zooming, Steering wheels.

Module-4 Building the Model and Modify
Walls, Doors, Windows, Components, Architectural columns, Roofs, Ceilings, Floors, Openings, Model text, Model lines, Compound structure, Sloped surfaces, Stairs, Ramps, Railings, Adding and modify curtain wall. Attaching wall to roof, Modifying the entry deck, Modifying the roofs.

Module-5 Presentation
Dimensions, Keynotes, Tags, Symbols, Adding legend views, Creating a detail callout, Adding filled and masking regions, Using detail components, Creating sheet, Sheet properties

REFERENCE BOOKS

1. Interiors: Perspective in Architectural Design Graphic - SMA Publishing Co. Ltd.,Japan, 1967.
2. Ernest Norling, Perspective drawing, Walter Fostor Art Books, California, 1986.
3. Bernard Alkins - 147, Architectural Rendering, Walter Foster Art Books, 1986.
4. Rober W.Gill, Advanced Perspective, Thames and Hudson, London, 1974.
5. Autodesk Revit Architecture 2012: No Experience required – Eric Wing
6. Mastering Autodesk Revit Architecture 2012 – James Vandezande, Phil Read, Edd

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Drawing Sheets			
a	of Module - 1	5	2	10
b	of Module - 2	5	3	15
2	Computer Lab of Module 3, 4 & 5	4	2.5	10
			TOTAL	35

B. ARCH. SEMESTER – IV
RAR – 405, ARTS AND GRAPHICS - IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To develop an appreciation and understanding of Indian contemporary art and trends.
- To develop skills of making mural, sculpture,furniture, pottery and fountains from fiber glass, mild steel, cast iron, stainless steel, wood, plaster of paris, terracotta, cement concrete and ceramics etc.
- To develop skills of graphic printing techniques.

SECTION – A, ARTS AND GRAPHICS

Module-1 History of Art — A brief introduction of Renaissance in Indian Art i.e. 19th century and Post-independence art of India.

Module-2 Indian Artists — A brief overview of arts and artist in India; Abanindra Nath Tagore, Nand Lal Bose, Jamini Roy, Amrita Sher Gill, M.F. Hussain, Satish Gujral and S.H.Raza etc.

Module-3 Design — Designing and live execution of murals, sculptures, furniture, pottery using materials like clay, wood, terracotta, Acrylic fiber sheet, Scrap metal, etc.

REFERENCE BOOKS

1. ABC of Indian Art- J.F.BLACKER.
2. A Concise History of Indian Art - ROY C. CRAVEN.
3. Maurya and Post Maurya Art- NIHAR RANJAN RAY
4. The Story of Indian Art - S.K. Bhattacharya

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Quiz of Module - 1**	**1**	**5**	**05**
2	**Seminar of Module – 2**	**2**	**10**	**20**
3	**Design & Model of Module – 3**	**1**	**10**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – IV
RAR – 406, ARCHITECTURAL SERVICES – II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To understand the basic principles of physics of electricity and light.
- To make them enable to draw the electrical layout with appropriate cross section of wires and illuminance calculations for residences.
- To know the characteristics and applications of the different types of modern lamps and luminaires.
- To familiarize the student with electrical bye laws as per NEC/BIS.

SECTION – A, ELECTRICAL

Module-1 Electrical

Introduction –
Terminology and architectural symbols (as per NBC/NEC) for electric installations in buildings.
Need to generate and save electricity, transmission and distribution of electricity (single and three phases), procuring service connection.
Familiarization to various lighting accessories, wires and cables, metering, distribution panels / boards etc. for single and three phase supply.
Guidelines for installation of fittings.
Design of simple electrical circuits –
Introduction to simple light and fan circuits.
System of connection of appliances and accessories e.g. series and parallel connection, joint box system, looping-in system.
Systems of wiring –
Basic considerations.
Various types of internal wiring systems e.g. cleat, casing and capping, batten and conduit (surface & concealed).
Protection of electrical installation and human life –
Basic considerations.
Protection against excess current, short circuit earth fault and protection against electric shock.
Introduction to various types of protection devices e.g. switches, fuses and circuit breakers.
Need for earthing of domestic fittings and appliances, earthing and its relation with soil resistivity, earth electrodes, earth wires.
Load assessment and selection of appropriate cross section of the conductor.

SECTION – B, ILLUMINATION

Module-2 Illumination

Introduction –
Terminology and unit.
Light and its characteristics – scattering, propagation, transmission, reflection, absorption, refraction and dispersion of light. Electromagnetic spectrum and visible radiation.
Illumination –
Types of illumination schemes e.g. Ambient,Task, Focal andDecorative etc.
Design considerations for illumination Schemes.
Methods for lighting calculation – Watts per square meter, Light flux and Point to point method.

Sources of light (Electrical)–
Familiarization and understanding ofelectrical sources of light e.g.
Thermal radiators - Incandescent,Halogen.
Discharge lamps– Low pressure (fluorescent, compact fluorescent, sodium, cold cathode neon), High pressure (mercury, metal halide, sodium).
New technologies - LED, Fiberoptics.
Luminaries –
Types of Luminaries – Indirect, Semi-indirect, General diffusing, Semi-direct and Direct.

SECTION – C, APPLICATION

Module-3 Electrical Drawing

The understanding of electrical needs for individual spaces e.g. Living room, Dining room, Bed room, Kitchen, Toilet, Staircases, and Corridors etc.
The electrical layout drawing for a residence.

Module-4 Field / Market Surveys

Familiarization to types of electrical luminaries available in market, manufactured by various brands e.g. Recessed mounted luminaries, Spot / Projectors, Surface mounted luminaries, Decorative luminaries, Pendant luminaries, Free-floor-standing luminaries, Up lights, Trunking lighting systens, Down Lights.

REFERENCE BOOKS

1. National Building Codeof India.
2. National Electrical Code.
3. Raina K.B. & Bhattacharya S.K., Electrical Design estimating and costing, New Age International (P) Limited, New Delhi,2004.
4. Rudiger Ganslandt & Harald Hofmann, Handbook of Lighting Design, Druckhaus Maack, Lüdenscheid, 1992.
5. Kevin Kelly& Kevin O'Connell, Interior Lighting Design - A Student's Guide.

CRITERIA FOR ASSESSMENT OF ASSIGNMENTS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheetsof Module - 3 (Service Drawings/Sketches)	1	10	10
2	Tutorial of Module – 1 & 2	2	7.5	15
3	Market Survey &Seminar of Module - 4	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – IV
RAR – 407, HISTORY OF ARCHITECTURE – III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To inform about the development of Western architecture from 1st century onward and its contextual and ecclesiastical aspects.
- To understand architecture as evolving within specific cultural contexts including aspects of politics, society, religion, climate and technology.
- To gain knowledge of the development of architectural form with reference to technology, style and character in western architecture.
- To comprehend and analyze spatial character, scale, and structure through historical and traditional built form.
- To comprehend and relate to the theoretical and philosophical basis of western architecture.

Module-1	**Early Christian Architecture**	Development of early church from Roman basilica. The concept of center and path of Christianity manifested through centralized and longitudinal church. Interiority of churches and the articulation of interiors to create spiritualized space. Study of different basilica churches in Italy.
Module-2	**Byzantine Architecture**	Centralization in Byzantine churches. Centrality and interiority of both cross-domed and cross in square planned church. Indistinct exterior of churches and the domed 'heavenly' interior. Construction of dome over polygonal compartments through the use of pendentives. Study of important churches in Constantinople
Module-3	**Romanesque Architecture**	Massiveness and verticality of medieval churches. Combination of the five towered structures and longitudinal basilica.Gradual integration of tower from early to later examples.Integration of centralized and longitudinal plans. Articulation of external wall like arcaded interiors resulting in dematerialization of exterior. Study of important cathedrals and churches from Italy and France.
Module-4	**Gothic Architecture**	Continued integration of centralized and longitudinal plans. Spatial and formal integration of Romanesque churches. Integration of wall and vault. Ribbed vault and the dissolution external wall to allow light. Sensitivity to light and use of stained glass for mysterious interiors. Need and development of different external buttressing. Study of important cathedrals and churches in France.
Module-5	**Renaissance Architecture**	Break with medieval churches for sources from Roman antiquity. Spatial centralization through simple addition of independent spatial elements. Use of elementary geometrical forms unified through symmetry and simple mathematical ratios. Reintroduction of anthropomorphic Classical Orders. Study of palazzos and development of centralized church form through specific examples from Italy.
Module-6	**Mannerism**	Conflict and tension in Mannerism in place of harmony and order of Renaissance. Dynamic interplay of contrasting elements as against static addition of independent units of Renaissance church. Interplay between manmade and nature in villas. Dynamism of urban spaces. Centralized longitudinal and the elongated central church plans. Study of important villas, churches and urban spaces in Italy.
Module-7	**Baroque Architecture**	Dynamism and systemization of Baroque architecture. Vitality and spatial richness with underlying systematic organization. Space as constituent element of

architecture, as a complex totality and indivisible figure, comprising of interacting spatial elements based on inner and outer forces. Sensitivity to effects of texture, color, light and water. Study of important urban spaces and churches in Italy and Germany.

REFERENCE BOOKS

1. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
2. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
3. Leland M Roth; Understanding Architecture: Its elements, history and meaning; Craftsman House; 1994
4. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,Inc.Pub., New York, 1972.
5. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,London, 1986.
6. Gosta,E.Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
7. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
8. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
9. Christian Norberg-Schulz, Meaning in Western Architecture, Praegur, 1975
10. Kenneth Frampton, Modern Architecture: A Critical History, Thames and Hudson, Ltd. 2007.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 7	7	4	28
2	Seminar/Presentation of Module 1 - 7	1	7	7
			TOTAL	35

B. ARCH. SEMESTER – IV
RAR – 408, RESEARCH / SEMINAR / WORKSHOP - III

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.

Module-1	**Introduction**	Styles of Referencing
Module-2	**Technical Writing**	Referencing Techniques, Bibliography.
Module-3	**Book Reviews**	Review of book and its presentation

LIST OF ASSIGNMENTS

1. Review of an architectural book/books prescribed by the assigned teacher.
2. Referencing assignments based on the book / topic assigned by the faculty member student is assigned with.
3. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford UniversityPress, New Delhi.
2. Kate L.Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition.
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 1**	**1**	**5**	**5**
2	**Tutorial of Module - 2**	**3**	**5**	**15**
3	**Tutorial of Module - 3**	**1**	**15**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER – IV
RAR – 409, VERNACULAR ARCHITECTURE

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	1	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To highlight the role of Vernacular Architecture & lessons useful in contemporary context
- To expose students to the varied vernacular and traditional architecture of India and the world.
- To connect the aspect of climate responsiveness and environment suitability of vernacular architecture to the ongoing design studio.

Module-1	**Introduction to Vernacular**	Definitions; Relevance; Role & scope of Vernacular Architecture; issues of concern in present day architecture and causative forces of the vernacular form.
Module-2	**Lessons from Vernacular Architecture**	Brief overview of the varied learnings from vernacular including Sense of Place, Spontaneity & variation, Control, Open Ended form Relationship, Symbols & Meanings.
Module-3	**Case/ Literature Studies**	Study of vernacular and traditional architecture of India and the world specifically in varied climatic zones.
Module-4	**Study of an existing Settlement**	Study of an existing settlement in the vicinity for on –site comprehension of afore-mentioned characteristics and developing a design criterion for the ongoing design exercise.

REFERENCE BOOKS:

1. Architecture of the Indian desert, Kulbushan Jain &Meenakshi Jain, Aadi Centre, Ahmedabad.
2. Encyclopaedia of Vernacular architecture of the World, Cambridge University Press.
3. House, Form & Culture, Amos Rappoport, Prentice Hall Inc, 1969.
4. VISTARA – The architecture of India, Carmen Kagal. Pub: The Festival of India, 1986.
5. Oliver Paul. Built to meet needs. Cultural issues in vernacular architecture. Italy: Routledge 2006.Print.
6. Architecture Without Architects: A Short Introduction to Non-pedigreed Architecture by Bernard Rudofsky
7. Bhatia, Gautam,Laurie Baker, Life, Work, Writings, New Delhi, India,1994 Penguin Books,.ISBN 0-14-015460-4

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Drawing Sheets / Presentation of Module - 1**	**1**	**5**	**5**
2	**Drawing Sheets / Presentation of Module - 2**	**1**	**5**	**5**
3	**Drawing Sheets / Seminar / Presentation of Module - 3**	**1**	**10**	**10**
4	**Measure Drawing & Model of Module - 4**	**1**	**15**	**15**
			TOTAL	**35**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 501, ARCHITECTURAL DESIGN - V

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	8	30	70	**100**	75	25	**100**	**200**	6	6 +6 HRS.

OBJECTIVES

- Understanding basic structure forms in relation to space and materials.
- To understand the different structural systems and their mechanism/logic.
- To understand the constraints and possibilities of designing with the range of structural systems available.
- To employ and integrate these structure systems into the design ideology, especially in proposals requiring large spans
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1 **Introduction** — Acquainting with the various structural systems and their relation to form, materials and function.

Module-2 **Types of Structural Systems** — Through seminars, drawings and models, a study of different structural systems, their mechanism of load bearing, adaptability, efficiency and limitations.

Trabeated:	Brick and stone, columns and beams slabs, one way and two way, coffers.
Arcuated:	Corbelled, Radiating Arch, Vault and Dome, Squinch and Pendentives.
Vector Structures:	Trusses and space frames.
Form Structures:	Folded slabs, Shells, Hyperbola-paraboloid.
Tensile:	Tents, Cables and Pneumatic vis-à-vis materials and plan shape/s

It should be noted that emphasis would be on the design parameters and graphical presentation of systems rather than their structural analysis.

Module-3 **Design Proposal** — Design of functional spaces that incorporate large span structures, repetitive modules, medium column free spans and multi-storied aspects that use the varied structural systems. For example factories, institutes, auditoriums, stadium, commercial malls and other campus designs etc.

Module-4 **Integration of design with structural system** — Development of the design proposal to the stage of integrating structure system necessary for the execution of the project and making relevant drawing for the same.

SUGGESTED STUDIO EXCERCISES

1. Literature study and Case Study of different structural systems as used in famous buildings of the world.
2. Presentation of the system with scaled models or actual structures in construction yard.
3. Design of buildings like Stadia, auditorium, Petrol Pump, Factories, Museums, Malls, and buildings using varied structural systems.
4. Study tours to relevant urban destinations for primary documentation.

REFERENCE BOOKS

1. Ching, Francis D. K. “Architecture : Form, Space and Order”, John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, “Universal Principles of Design”, Rockport – Publications, Massachusetts.
3. AhmetHadrevic, “Structural Systems in Architecture”, Book Serj Publishing, South Karolina.
4. Heinoengel, “Structure System”

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module - 1	1	5	5
2	Seminar / Presentation & Model of Module - 2	1	10	10
3	Design Exercises (Minor) of Module - 3	1	20	20
4	Design Exercises (Major) of Module - 4	1	35	35
			TOTAL	70

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 502,CONSTRUCTION & MATERIALS – V

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To acquaint the students tousage of building materials such as Metals (Ferrous), Floorings.
- To understand the use of these building materials in building works.
- To understand the use of the metal doors/windows in existing and new construction.
- To familiarize the student with the building construction practices on site.

SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1 Metals (Ferrous) Ferrous-Iron (Pig, Cast & Wrought).
Variety of Mild Steel sections – Sheets (plain & corrugated), Flats, Bars (round & square), Angles (Equal and Unequal), R.S. Sections (I beams, Channels, Tees).
Hollow Tubular sections available for application in building industry.
Stainless steel and Alloys.

Module-2 Floor& Floor Finishes Brick, Cement Concrete, Stone, Terrazzo, Chequered Tile, Ceramic Tile, Vitrified Tiles, Wooden.

Module-3 Reinforced Brick Work Types, Mixing, Curing, Water Cement Ratio, Qualities and Workability.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit assembly workshops/shops etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4 Workshop/Construction Yard Practice Practicing in construction yard / workshop by making the examples of metal joinery, fixing of flooring, fixing of dado, timbering of shallow trenches and doorsamples.

Module-5 Site Exposure Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in structural steel works.
2. To construct examples of structural steel works in construction yard.
3. To survey construction work on site and submit report. To construct examples of reinforced brickworkand varietyof flooring in construction yard.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6 Structural Steel Works Typical metal joinery - Mechanical (riveted & bolted), Soldering and Brazing and welding.
Detailing of structural steel work – Beam to Column joint, Beam to Beam joint, Column Splice, Column Base, Roof Truss to Column Joint.
Steel Stairs.

Module-7 Doors & Windows (Metals) Mild steel L and Z section, Pressed steel section.

Module-8 Shutters (Operational Mechanisms) Complete understanding of operational mechanism (automatic and manual) of variety of Rolling shutters and Collapsible shutters.

Module-9 Reinforced Brickwork Reinforced brick piers, lintels, slabs and projections.

Module-10 Floor/Dado/Skirting Complete process of laying of floor and skirting - Brick, Cement Concrete, Mosaic and Terrazzo floors.
Laying and fixing of Stone slabs, Chequered Tile, Ceramic tiles, Vitrified tiles and Wooden (parquet and plank) on subfloors and walls.

CONSTRUCTION PLATES

1. To understand the application of structural steel works in buildings.
2. To understand the application of metal doors and windows in buildings.
3. To understand the application of metal shutters (Rolling) in buildings.
4. To understand the application of metal shutters (Collapsible) in buildings.
5. To understand Reinforced brick piers, lintels, slabs and projections.
6. To understand laying of above mentioned floors and fixing of above tiles on floors and walls.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra &Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell's Structure & Fabric-II
10. Principle & Practices of Heavy Construction: Smith & Andres
11. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
12. Building Materials by SC Rangwala: Charotar Pub. House, Anand
13. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
14. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
15. National Building Code of India (Latest Edition), Bureau of Indian Standards.
16. Engineering Materials-Deshpande.
17. Engineering Material-Roy Chowdary
18. Designing with models – Criss. B. Mills.
19. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
20. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
21. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey&Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – V
RAR – 503, ARCHITECTURAL STRUCTURES - V

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES:

- To understand the various structural elements and their application in structural design and analysis by **LIMIT STATEMETHOD**.

Module-1	**Analysis and Design of R.C.C. Slab**	Analysis and Design of one way, two way and flat slabs and detailing of its reinforcement.
Module-2	**Analysis and Design of R.C.C. Beam(Continuous)**	Analysis and Design of R.C.C. continuous beam and detailing of its reinforcement.
Module-3	**Analysis & Design of Portal frame (R.C.C.)**	Analysis and design of portal frame (Single bay, Single storey) with fixed and hinged base, in R.C.C.
Module-4	**Analysis and Design of R.C.C. Stairs**	Introduction, Type of stairs, Effective span of stairs, Loading on stairs, Analysis and design of stairs (dog legged with waist slab) and detailing of its reinforcement.
Module-5	**Elementary Soil Mechanics**	Classification of Soil, Properties of Soil, Safe bearing capacity, Active & Passive earth pressure.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student's exposure to practical aspects of design.

REFERENCE BOOKS

1. Ashok K. Jain , "Reinforced Concrete" Limit State Design.
2. M.L. Gambhir, "Fundamentals of Reinforced Concrete Design".
3. P.C. Varghese., "Advanced Reinforced Concrete Design".
4. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain "R.C.C.Designs"

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	**5**	**7**	**35**
			TOTAL	**35**

B. ARCH. SEMESTER – V
RAR – 504, INTERIOR DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To initiate students into theory and practice of Interior Design.
- To familiarize students with modern materials and techniques useful for furniture and interior design.
- To appreciate early interventions in design of furniture

Module-1	**Introduction to Interior Design**	Definitions related to interior design; Reviewof enclosing elements like walls, floors, ceilings, openings, staircases, furniture& design elements such as color, light textures in interior spaces. Principles of interior design.
Module-2	**History of Interior &Furniture Design**	Concise understanding of evolution from ancient to modern, post-modern ideologies to contemporary(Egyptian, Greek, Roman, Gothic, Baroque, Renaissance, Arts and Crafts Movement, Art Nouveau, De Stijl, Modernism, Post Modernism and Contemporary) Understanding role of materials and technology in their transformation and various theories associated in their evolution
Module-3	**Study of Materials, Finishes & their applications in Furniture & other Interior Elements**	An in-depth understanding of the characteristics and workability of various materials used in interiors. Their classification could be on basis of elements of usage (floors, ceilings, walls, doors, windows and fabric/upholstery) or materials based like wood, metal plastics and their variants.
Module-4	**Understanding innovation in Furniture &Interior Design**	Modern materials, Modular furniture, Interior landscaping, Fittings & fixtures.
Module-5	**Analysis &Design of Furniture**	Analyzing existing designs of selected furniture on basis of ergonomics, user type, economics, material, joinery and maintenance to ascertain their suitability Design furniture for specific use complying to the aforementioned formulated design criteria. Build scaled models of the designed furniture for better understanding of working and materials.
Module-6	**Analysis &Design of small Interior spaces**	Analyse small selected interior spaces like study, bedroom, executive/ architect office, retail outlet, conference, reception & waiting lobby including toilets and kitchens in detail, for varied aspects like function, ergonomics, materials and establishing detailed design criteria. Design of selected small interior spaces on specific sites/ locations based on formulated design criteria using modern design methodologies. Develop design details of the afore-designed projects for their furniture and finishing.

APPROACH

1. Course should be covered through lectures and seminars by the students.
2. Attempts should be made for a thorough study of materials and techniques used in interiors and their applicability.
3. Scaled models of design exercises should be encouraged.
4. Regular studio work for total grasp of the subject is essential.
5. Report making for study of furniture and craft styles in India should be done

REFERENCE BOOKS

1. Ching, Francis D.K. Interior Design Illustrated, V.N.R. Pub. NY 1987.
2. Pandya ,Yatin. Elements of spacemaking.
3. Massey, Anne. Interior design since 1900.
4. Litchfield, Fredrick. Illustrated History of Furniture from the earliest to the present time.
5. Fiell, Charlotte and Peter. 1000 chairs

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Seminar / Presentation of Module – 1, 2 & 3	3	4	12
2	Site/Market Survey of Module – 4	1	3	3
3	Design Exercises & Model of Module - 5	1	8	8
4	Design Exercises of Module - 6	1	12	12
			TOTAL	35

B. ARCH. SEMESTER – V
RAR – 505, WORKING DRAWINGS & DETAILS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To understand and making drawing/ details necessary for final execution of a project.
- To integrate all services and structure system in the working drawing project.

Module-1 Working Drawings

Making complete set of working drawings for the residence or any other project designed by the student.The drawings to incorporate all necessary information complete with schedule and all specifications. The Working Drawings to include:

1. Site plan.
2. Foundation layout with details of foundations and D.PC.
3. Ground floor Plan.
4. First Floor Plan.
5. Terrace Plan
6. Sections
7. Elevations.

Module-2 Services Drawings

Making complete set of servicesdrawings for the above said project. The drawings to incorporate services details complete with schedule and all specifications. The Services Drawings to include:

1. Electrical Layout.
2. Plumbing Layout.
3. Sanitary Layout.
4. Drainage Layout.
5. Rain Water Disposal / Harvesting Layout and Details.
6. Toilet details.
7. Kitchen / Pantry Details.

Module-3 Working Details

Making complete set of working details for the above said project. The drawings to incorporate details complete with schedule and all specifications. The Working Details to include:

1. Doors and Windows Drawings and Details.
2. Staircase Details including railings.
3. Details of Grills,Parapet or railings.
4. Typical wall section showing foundation, DPC, skirting, sill, lintel, slab and terracing details.

Module-4 Finishing Drawings

Making complete set of finishingdrawings for the above said project. The drawings to incorporate finishing details complete with schedule and all specifications. The Finishing Details to include:

1. Doors and Windows Frame and Shutter details.
2. Flooring & Skirting pattern and fixing details.
3. Dado / Wall tile pattern and fixing details.
4. Wall Cladding pattern and fixing details.
5. Plaster Pattern with Colour schemes.

SUGGESTED STUDIO EXCERCISES

1. Complete set of working drawings as suggested above for a medium sized residence or any other project designed by the student.

APPROACH

1. Course should be covered through lectures and studio exercises.
2. The students would be familiarized with vernacular terminology as prevalent in this part of the country.
3. The emphasis will be working drawings (as per various codes)and construction details as applicable to Indian conditions.
4. Site visits to understand the importance of working drawings and market surveys to understand modern materials and their manufacturers'details will be an integral part of sessional work.

REFERENCE BOOKS

- Various codes prevalent.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Project			
a	Major of Module 1 - 4	1	20	20
b	Minor of Module 1 - 4	1	10	10
2	Site Visit & Report of Module 1 - 4	1	5	5
			TOTAL	35

B. ARCH. SEMESTER – V
RAR – 506, ARCHITECTURAL SERVICES – III (AIR CONDITIONING SYSTEMS & LIFT SERVICES)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To develop an understanding of the advanced building services such as Air conditioning and lifts and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

SECTION – A, AIR CONDITIONING SYSTEMS

Module-1	**Introduction & Principles**	Fundamentals of Air Conditioning System Design. Building Plans, Drawings, and Schematics. Refrigeration Cycle, Psychometric chart, Cooling load for air conditioning.
Module-2	**AC systems**	Comfort cooling systems & their working - Unitary air conditioning- window ac & split ac. Package ac system. Evaporative cooling systems. Central air conditioning their parts- A.H.U., Cooling plant, Cooling tower.
Module-3	**Air Distribution Systems**	Air Distribution Systems - fans, filters, fan coil units, ductwork, outlets, dampers.

SUGGESTED EXCERCISES

- Site visits of buildings where different types of Air-conditioning systems have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of an air-conditioning system and the location of their parts and how they will be connected.

SECTION – B, LIFT SERVICES

Module-4	**Introduction & Principles**	Fundamentals of lift services System Design. Building Plans, Drawings and Schematics. Definitions regarding lifts such as average travel lift carrying capacity, rated load, rated speed, RTT etc. Grouping of lifts and design standards of a lift lobby.
Module-5	**Lift types**	Types of Lifts. Working of lifts with details of lift section describing various parts of lifts.
Module-6	**Escalator**	Types of Escalators. Fundamentals of escalators, Function and working of Escalators.

SUGGESTED EXCERCISES

- Site visits of buildings where different types of lifts & escalators have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-storied building installation of these systems and the location of their parts and how they will be connected.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCE BOOKS

1. Mitchell's Building Construction: Environment & Services, Peter Burberry, 8th Edition, 1997, Longman.

2. Mechanical and Electrical Equipment for Buildings, B. Stein and J. Reynolds, 10th Edition, 2005, Wiley & Sons Inc.
3. The Building Systems Integration Handbook, R Rush, 1991, American Institute of Architects.
4. Building Services: A Guide to Integrated Design: Engineering for Architect, RP Parlour, 2008, Integral Publishing.
5. Understanding Buildings: A Multi-disciplinary Approach, E Reid, MIT.
6. William H.Severns and Julian R.Fellows, "Air-conditioning and Refrigeration", John Wiley and Sons, London, 1988.
7. A.F.C. Sherratt, "Air-conditioning and Energy Conservation", The Architectural Press, London, 1980.
8. ASHRAE Publications.
9. National Building Code of India (Latest Edition), Bureau of Indian Standards.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	4	20
2	Seminar/Presentation of Module 1 - 6	1	10	10
3	Site Visit Reports of Module 2 & 5	2	2.5	5
			TOTAL	35

B. ARCH. SEMESTER – V
RAR – 507, HISTORY OF ARCHITECTURE – IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- Understanding of the period in terms of its location, climate as well as the socio-cultural, historical, economic and political influences of the time.
- Study of the building 'types' and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.
- Understanding the intentions of the period and architects as a solution to the need or demands of the period.

Module-1 Introduction: Introduction and understanding of 'Islam's' philosophy and its consequent rituals and their interpretation in building type e.g. mosque, tomb, fort and their elements like domes, minarets, arch, squinch, landscape, motif, calligraphy, directionality, symmetry, geometry, material, court, water, patterns etc.

Module-2 The Sultanate Style: The architecture of early Islamic dynasties that ruled from Delhi like the Slave, Khalji, Tughlaq, Sayyid, Lodhis and ShershahSuri regimes. The formation of 'Indo-Islamic' style that was the amalgamation of Islamic space and prevalent Hindu techniques of building and materials.

Module-3 Provincial Architecture: Development of colloquial styles in various provinces of India like Punjab, Jaunpur, Gujrat, Bengal, Bijapur, Bidar and Deccan.

Module-4 Cities and Citadels: Morphology of fortified cities of Jaisalmer, fort/ palaces like Mandu, Chittorgarh, Orchha, Datia, Jodhpur etc. with an overview on architectural types like havelis, stepwells, gates, baradaris etc.

Module-5 Mughal Architecture: The architecture of the Timurids in India- Babur, Hamayun, Akhbar, Jahangir and Shahjahan, which was the culmination of the Indo-Islamic paradigm. The proportions, structure systems, landscape, materials, scale and distinct features.

Module-6 The Later Moghuls: The Oudh architecture, which was a blend of the Mughal style and the British features, in Lucknow and its environs. The manzils, baghs, kothis, imambaras, karbalas: their planning, materials and techniques.

Module-7 Colonial Architecture: The British architecture of the colonial days in India- the capitol at Delhi and the residency at Lucknow emphasizing on their planning criteria and architectural features. Incorporation of local motifs and materials.

APPROACH:

1. Lectures to be specifically conducted with the visual aids and seminars presented by students.
2. Students will make written assignments and seminar presentations on architectural characteristics that identify the building types and the intentions of the period in response to context and time.
3. Free hand sketches and orthographic drawings could made by students in the tutorials on specific building examples to familiarize them with the architectural character that identify the works of the particular period.
4. Scaled, sectional models of historical buildings to be encouraged to understand the scale and proportion.

REFERENCE BOOKS

1. Percy Brown, "Islamic Architecture."
2. Jown'd Hoag, "Islamic Architecture (History of World Architecture)", 2004.
3. Rober Hillenbrand " Islamic Art and Architecture" Tames and Hudson.
4. Rober Hillenbrand, "Islamic Form Function and Meaning".
5. Adam Barkman, "Making Sense of Islamic Art and Architecture", Tames and Hudson.
6. Tadgell, "World Architecture".

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheets/Sketches of Module 1 - 7	4	5	20
2	Tutorial/Quiz of Module 1 - 7	3	2.5	7.5
3	Seminar	1	7.5	7.5
			TOTAL	35

B. ARCH. SEMESTER – V
RAR – 508, RESEARCH / SEMINAR / WORKSHOP - IV

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.
- To understand the basic methodology of writing a technical paper.
- To be able to write a technical paper of about 2000 words.

Module-1 Introduction Anatomy of a technical paper- parts of a technical paper; its chronology

Module-2 Technical Writing

- Intent of the paper
- Structuring the paper; formulating a synopsis
- Identifying sources- categorization into direct and indirect; sequencing them in order of significance.
- Referencing

Module-3 Writing a technical paper Writing a paper of 2000 words in following stages:

- Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope, Methodology.
- Structuring the body of the paper in detail
- Ascertaining Primary and Secondary Sources
- Utilizing the sources to reach to the desired objectives
- Editing the paper

LIST OF ASSIGNMENTS

1. Writing a paper of 2000 words. This should be broken down stage wise and a feedback be given at every stage.
2. The assignments preferably should be associated with the ongoing design assignments and design workshops could be clubbed with research also.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford UniversityPress, New Delhi.
2. Kate L.Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition.
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 1**	**1**	**5**	**5**
2	**Tutorial of Module - 2**	**2**	**5**	**10**
3	**Tutorial of Module - 3**	**1**	**20**	**20**
			TOTAL	**35**

B. ARCH. SEMESTER – V
RAR – 509, SOCIOLOGY

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To expose the students to the relationship between man and environment.
- To familiarize the students with basic concepts, theories and issues of Sociology and its relevance to Architecture.

Module-1	**Introduction**	Study of Sociology, Sociology and Architecture, Basic concepts –Society, Group, Community (Rural and Urban), Association, Institution.
Module-2	**Culture and Society**	Concepts of culture, Cultural identity and cultural diversity, Factors of socio-cultural changes.
Module-3	**Social Development**	Introduction to the concept of development, Types of development - rural, urban and rurban.
Module-4	**Demography**	Population growth and its impact, Population subsistence, Migration.
Module-5	**Social Institutions**	Family, Marriage, Religion.
Module-6	**Social Infrastructure**	Education, Health, Recreation.

REFERENCE BOOKS

1. Contemporary Sociology by M. Francis Abraham, Oxford University Press: New Delhi.
2. An Introduction to Sociology by Vidya Bhushan and D.R. Sachdeva, Kitab Mahal: Allahabad.
3. Sociology: A Systematic Introduction by Harry M. Johnson, Allied Publishers:New York.
4. Sociology of Change and Development by G.R.Madan and Amit Agarwal, Vivek Prakashan:Delhi.
5. Indian Society and Culture – Continuity & Change by Nadeem Hasnain, Jawahar Publishers and Distributers: New Delhi.
6. Principles of Population Studies by Asha A. Bhende & Tara Kanitkar, Himalaya Publishing House: Mumbai.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1, 2, 3 & 5**	**4**	**5**	**20**
2	**Seminar/Presentation of Module 4& 6**	**2**	**7.5**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER – VI
RAR – 601, ARCHITECTURAL DESIGN - VI

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	0	8	30	70	**100**	75	25	**100**	**200**	6	6 +6 HRS.

OBJECTIVES

- To understand the constraints of multiple housing units in an urban setting with respect to social norms, climate and client's expectations.
- To understand design limitations due to authority guidelines and making drawings / details necessary for final execution of a project.
- To integrate services and structure system in the housing design project.
- Field trips to relevant sites shall be compulsory for all assignments.

Module-1	**Introduction**	Acquainting with the various ways of designing a group housing in urban context i.e. low/medium rise- high density; high rise- high density etc.
Module-2	**Study and Analysis**	Through literature studies and case studies analyze the constraints, typologies and interventions in housing throughout India and the rest of the world.
Module-3	**Design Proposal**	Design of a housing project incorporating varied formats of grouping on an actual site with specific bye-laws and regulations.
Module-4	**Integration of Services and Structure**	Development of the housing proposal to the stage integrating services, structure and other infrastructural facilities necessary for the final execution of the project and making relevant drawing for the same .

SUGGESTED STUDIO EXCERCISES

1. Design of group Housing in varied formats with diverse by-laws and regulations.

REFERENCE BOOKS

1. Ching, Francis D. K. "Architecture: Form, Space and Order", John Wiley and Sons Inc.
2. Lidwell, William, Holden, Kestina, Butler, Jill, "Universal Principles of Design", Rockport – Publications, Massachussets.
3. Correa, Charles, "The New Landscape",
4. Jogelekar& Das, S.K, "Contemporary Indian Architecture: Housing and Urban Development", HUDCO, 1995
5. Rewal,Raj, "Humane Habitat at Low Cost", Architectural Research Cell, 2000.
6. Steele, James, "The Complete Works of BalakrishnaDoshi: Rethinking Modernism for the Developing World", Super Book House, Mumbai, 1990.
7. Alexander, Christopher, "Pattern language", Oxford University Press, 1977.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 1**	**1**	**5**	**5**
2	**Seminar / Presentation of Module - 2**	**2**	**5**	**10**
3	**Design Exercises (Minor) of Module - 3**	**1**	**10**	**10**
4	**Design Exercises (Major) of Module - 4**	**1**	**45**	**45**

			TOTAL	**70**

B. ARCH. SEMESTER – VI
RAR – 602, CONSTRUCTION & MATERIALS – VI

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.

OBJECTIVES

- To acquaint the students to usage ofbuilding materials such as Metals (Non -Ferrous), Additives & Admixtures and Construction Equipments.
- To understand the use of these building materials in building works.
- To introduce and familiarize the students with the various temporary construction works required for RCC construction works.
- To familiarize the student with the building construction practices on site.

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SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	**Metals (Non-Ferrous)**	Non Ferrous – Copper & Copper based alloys (**B**rass & Bronze), Tin, Cadmium, Chromium, Zinc, Lead and Nickel. Metal Coatings – Electroplating, Anodizing.
Module-2	**Additives & Admixtures**	Various additives and admixtures – Cementitious (crystalline) systems, Integral systems, Proprietory systems, Cementitious Coating system.
Module-3	**Construction Equipments**	Electric hand tools, Vibrators, Pumps, Compactors/Rollers. Earth Moving & Excavation – Dozers, Scrappers, Graders, Shovels, Backactor, Dragline, Trenchers. Transportation – Lorries, Trucks, Dumpers, Hoist, Cranes (mobile, static, tower). Concrete mixers and pumps for ready mix concrete.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit assembly workshops/shops etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4	**Workshop/Construction Yard Practice**	Practicing in construction yard by making the examples of components covered under 'Building Construction Technology'.
Module-5	**Site Exposure**	Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in RCC and temporary construction works.
2. To construct examples of RCC works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6	**Doors , Windows & Partitions (Aluminium)**	Doors Frames and Shutters. Windows Frames and Shutters. Partitions Framework & fixing with other suitable materials.
Module-7	**Temporary Constructions**	Centering, Shuttering and scaffolding

Module-8	**R.C.C. – I (Formwork & Laying)**	Foundations - Isolated, Combined, Cantilever, Eccentric footing. Grillage and Raft foundation. Pile foundations – details of pile, varieties of piles, pile caps. Understanding of steel reinforcement types, laying, bending and binding.
Module-9	**R.C.C. – II (Formwork &Laying)**	Columns, Lintel, Projections/Chujjas and Beams. Understanding of steel reinforcement types, laying, bending and binding.
Module-10	**R.C.C. – III (Formwork & Laying)**	Slabs - Simply supported, Continuous & Cantilevered. Staircases – Waist and Folded slab. Understanding of steel reinforcement types, laying, bending and binding.

CONSTRUCTION PLATES

1. To understand the application of Aluminium Doors and Windows.
2. To understand the application of Partitionsin Aluminium framework with other suitable panel materials.
3. To understand the application of temporary construction in buildings.
4. To understand the construction of RCC Foundations along with its' steel works.
5. To understand the construction of RCC Columns, Lintels, Projections and Beams along with its' steel works.
6. To understand the construction of RCC Slabs&Staircasesalong with its' steel works.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra &Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell's Structure & Fabric-II
10. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
11. Properties of Concrete A. M. Neville
12. Concrete Admixture Handbook: Properties, Science & V. S. Ramchandran Technology
13. Principle & Practices of Heavy Construction: Smith & Andres
14. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
15. Building Materials by SC Rangwala: Charotar Pub. House, Anand
16. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
17. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
18. National Building Code of India (Latest Edition), Bureau of Indian Standards.
19. Engineering Materials-Deshpande.
20. Engineering Material-Roy Chowdary
21. Designing with models – Criss. B. Mills.
22. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
23. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
24. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
25. Testing of Concrete in Structures J H Bungey and S. G. Millard

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Construction Sheets/Plates of Module 6 – 10**	**6**	**4**	**24**
2	**Tutorial/Quiz/Sketches of Module 1 – 5**	**2**	**3**	**6**
3	**Market Survey&Seminar of Module 1 – 3**	**1**	**10**	**10**

4	**Workshop/Yard of Module 4**	**1**	**4**	**4**
5	**Site Visit Reports of Module 5**	**2**	**3**	**6**
			TOTAL	**50**

B. ARCH. SEMESTER – VI
RAR – 603, ARCHITECTURAL STRUCTURES - VI

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To understand the structural behavior of various structural elements.
- To understand the analysis and design of R.C.C. structures and their use in building industryby **LIMIT STATEMETHOD**.
- To understand the analysis and design of Steel structures and their use in building industry by **LIMIT STATEMETHOD**.

Module-3 Analysis & Design of R.C.C. Column
Introduction, Effective height of column, Assumptions, Minimum eccentricity, Analysis and design of short R.C.C. column under pure axial load as well as under axial load and bending moment and detailing of its reinforcement.

Module-2 Analysis & Design of R.C.C. Foundation &Footing
Introduction, Type of foundation, Depth of foundation, Theory & design of axially loaded isolated square footing and detailing of its reinforcement.
Pile foundation - Introduction, classification and its application.

Module-3 Analysis and Design of R.C.C. Retaining wall
Introduction, Types of retaining walls, Analysis and Design of cantilever retaining walls and detailing of its reinforcement

Module-4 Analysis and Design of Steel Structure
Various types of connections-
Riveted connection – Introduction, Classification, Strength of riveted joint.
Bolted connection – Introduction, Classification of bolts based on type of load transfer, Terminology, Specifications for spacing and edge distances of bolt holes as per I.S. 800-2007, Types of bolt connections, Type of actions on bolts, Design strength of plates in a joint, Design strength of bearing bolts.
Welded connection – Introduction, Types of welded joints, Important specifications for welding as per IS code, Design strength of welded joints.
Analysis and Design of various types of members -
Tension members – Introduction, Design Strength, Analysis and design of tension member.
Compression members – Introduction, Slenderness ratio, Actual length, Effective length, Design strength, Analysis and design of Compression member.

Module-5 Steel Structure
Understanding of Miscellaneous Structural Elements –
Beam and plate girder & its use in building industry.
Grillage foundation and its' components & its use in building industry.
Types of roof trusses and nomenclature of its members.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student's exposure to practical aspects of design.

REFERENCE BOOKS

1. Ashok K. Jain , "Reinforced Concrete" Limit State Design.
2. M.L. Gambhir, "Fundamentals of Reinforced Concrete Design".

3. P.C. Varghese., “Advanced Reinforced Concrete Design”.
4. Dr. B.C. Punmia; Er. Ashok Kumar Jain; Dr. Arun K.Jain “R.C.C.Designs”
5. S.S Bhavikatti “ Steel Structures by Limit State Method as Per I.S. 800-2007

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	7	35
			TOTAL	35

B. ARCH. SEMESTER – VI
RAR – 604, DISASTER MANAGEMENT

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES

- To make the students understand the disaster management cycle.
- To create awareness about natural disasters, factors that cause them, and to foster knowledge about strategies for disaster prevention and management.
- Overview of major natural disaster through case studies.
- Their role in design & planning solutions, for reduction of risk and damages caused.

Module-1 Hazards & Disasters Introduction to disaster management, Indian scenario, Understanding of disaster, Hazard and its classification, Vulnerability, Capacity, Risk.
Various Types of disasters.
To understand in detail for the cause, adverse effects, distribution patterns, mitigation measures of Earthquake, Tsunami, Cyclone, Flood and Landslide.
Disaster Management cycle.

Module-2 Case Studies Studies to understand above mentioned disasters (National as well as international) occurred in the past & their inferences.

Module-3 Disaster Preparedness Disaster Management Act, guidelines NDMA.
Vulnerability Assessment & warning systems for above said disaster types.

Module-4 Disaster Response Programmes and studies for disaster reduction, Communications.

Module-5 Disaster Mitigation Pre disaster, emergency, transition, and recovery. Disaster management plan, Natural crisis management committee, State crisis management group.

Module-6 Disaster Resistant Construction Techniques Risk reduction measures through land use control, site planning and land management, design and construction of structures for above mentioned disaster.

REFERENCE BOOKS

1. Building Configuration and Seismic Design-Christopher Arnold.
2. Structural failures in Residential Buildings-Frich Schild & Others.
3. Handbook of Planning security Planning & Design-Peter S. Hopf.
4. S.Rajagopal – Problems of housing in cyclone prone areas – SERC, Vol.2 , Chennai, 1980.
5. Office of the UN Disaster Relief Co-ordinator – Disaster prevention and mitigation, Vol 12, Social and Sociological aspects – UNO, NY, 1986.
6. F.C.Cony et.al – Issue and problems in the prevention of disaster and housing – A review of experiences from recent disasters – Appropriate reconstruction and training information centre, 1978.
7. S.Ramani, Disaster management – Advanced course on modern trends in housing – SERC, Vol 2, Chennai, 1980.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 6**	**5**	**4**	**20**
2	**Seminar / Presentation of Module 1**	**1**	**15**	**15**

			TOTAL	**35**

B. ARCH. SEMESTER –VI
RAR – 605, ESTIMATION & SPECIFICATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To initiate the students into theory and practice of estimation and quantity surveying.
- To develop the understanding of specification writing.

Module-1 Specifications (Materials)
Introduction, importance and scope.
Types of specifications, Correct form and sequence of clauses for writing specifications. Study and uses of standard specifications viz; drafted by C.P.W.D.
Writing detailed specifications for various building materials eg. Bricks, Aggregates (fine & coarse), Cement, Reinforcement, Timber, Glass and Paints.

Module-2 Specification (Items of works)
Writing detailed specifications for various items of work eg. Earthwork in foundation, Cement concrete, Reinforcement cement concrete work, Brick work in cement mortar, Damp proof course, Wood works (door & windows), Glazing, Plastering (cement & sand), Flooring (cement concrete & tiles), Distempering (dry & oil bound), Painting on wood & iron work, Water proof cement painting, Brick bat coba terracing.

Module-3 Estimation
Introduction, Importance & scope.
Types of Estimates – Preliminary, Plinth area, Cubical content, Approximate quantity, Detailed / Item rate method estimates.
Method of Estimation – Separate / individual wall, Centre line methods of estimation.

Module-4 Estimation Exercises
Exercises in estimation using different methods, for small or medium size buildings.

Module-5 Rate Analysis
Labour out turn and norms of consumption of basic materials.
Principles of analysis of rates, Market / DSR rates of labour and materials.
Exercises in rate analysis of various items of work mentioned in Module – 2.

Module-6 Accounting Procedures
Introduction to P.W.D accounts procedure, measurement book, daily labour, muster roll, stores, stock, and issue of material from stock, indent form, impress account, cash book, and mode of payment.

LIST OF ASSIGNMENTS

1. To study the various types of estimates.
2. To prepare detailed estimate for a small building.
3. To study the importance and correct form of writing specifications.
4. To prepare detailed specifications for various items.
5. To study the principles of analysis of rates and prepare analysis of rates for various items of work.
6. To understand the standard accounts procedure and record keeping.

APPROACH

- The course would be covered through lectures and tutorials.
- The students' seminars will help realize the grasp on the subject matter.

REFERENCE BOOKS

1. Dutta, B. N. (2003) *Estimating and Costing,* UBS Publishers
2. Birdie, G. S. *Estimating and Costing*
3. Chakraborthi, M. *Estimation, Costing and Specifications*, Laxmi Publications
4. Kohli, D.D and Kohli, R.C. (2004) A Text Book of Estimating and Costing, S.Chand & Company Ltd.
5. Brook, Martin. (2004) *Estimating and Tendering for Construction Work*, 3rd edition, Elsevier.
6. Ashworth, A. (1999) *Cost studies of buildings*, Pearson Higher Education
7. Buchan, R., Grant, F. and Fleming, E. (2006) *Estimating for Builders and Quantity Surveyors*, 2nd edition, Butterworth-Heinemann
8. Cross, D.M.G. (1990) *Builders' Estimating Data*, Heinemann-Newnes
9. McCaffer, R. and Baldwin, A. (1991) *Estimating and Tendering for Civil Engineering Works*, 2nd edition, BSP
10. Sher, W. (1997) *Computer-aided Estimating: A Guide to Good Practice*, Addison Wesley Longman
11. (2004) *Standard Handbook for Civil Engineers*, McGraw-Hill
12. Standard Schedule of Rates for Delhi, CPWD & UPPWD.
13. Standard Specifications, CPWD & UPPWD
14. I. S. 1200 Parts I to XXV – Method of Measurement of Building and Civil Engineering Works, Bureau of Indian Standards
15. National Building Code of India (Latest Edition), Bureau of Indian Standards.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 6**	**5**	**5**	**25**
2	**Seminar of Module 1 - 2**	**1**	**10**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – VI
RAR – 606, ARCHITECTURAL SERVICES – IV (FIRE PROTECTION & ELECTRONIC SECURITY AND SURVEILLANCE SYSTEMS)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To develop an understanding of the advanced building services such as Fire Protection and Security and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

SECTION – A, FIRE PROTECTION

Module-1	**Introduction**	Causes and spread of fire. Fire triangle/ tetrahedron. Classes of fire. Combustibility of materials and fire resistance. Building Plans, Drawings, and Schematics.
Module-2	**Fire Detection & Alarm Systems**	Fire Detection Equipments- Heat &Smoke sensors. Fire Alarm Systems.
Module-3	**Fire fighting & Extinguishing Techniques**	First stage firefighting equipment, Ladders, Snorkel ladder. Fire fighting pump and water storage, Hose and hose fittings, Dry and wet risers, Automatic sprinklers. Fire Extinguishers - Portable fire extinguisherand other fire fighting equipments. Means of escape, Fire escape, Fire doors andWater curtain.

SUGGESTED EXCERCISES

- Site visits of buildings where different types of Fire protection equipments have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-strayed building installation of these systems and the location of their parts and how they will be connected.

SECTION – B, ELECTRONIC SECURITY AND SURVEILLANCE SYSTEMS

Module-4	**Perimeter Protection, Intrusion Detection & Alarm Systems**	Perimeter Protection - Barriers, Doors, Gates, Turnstilesand Fences. Intrusion Detection Sensors and Systems - Outdoor & Indoor. Building plans, Drawing & Schematics.
Module-5	**Access Control**	Introduction to Access Control Systems, Locks & Emergency Exits. Visitor Management Systems. Identification Systems – PIN, Card, Wireless systems and Biometric systems.
Module-6	**Surveillance & Recording System**	Components of Basic Systems. Security Lighting, Illumination including Infra-red. Understanding CCTV cameras - Pan, Tilt &Zoom mechanisms. Recording Systems – Digital and Analog Recording.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCE BOOKS

1. Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) by Reinhold A. Carlson, Robert A. Di Giandomenico.
2. Building Automation: Control Devices and Applications by In Partnership with NJATC (2008).
3. Building Control Systems, Applications Guide (CIBSE Guide) by The CIBSE (2000).
4. Security/Fire Alarm Systems: Design, Installation, and Maintenance by John E. Traister (1995).
5. CCTV (Newnes) by Vlado Damjanovski (1999).
6. Security, ID Systems and Locks: The Book on Electronic Access Control (Newnes) by Joel Konicek and Karen Little (1997).
7. Integrated Security Systems Design: Concepts, Specifications, and Implementation (v. 1) by Thomas L. Norman (2007).
8. Access Control Systems: Security, Identity Management and Trust Models by Benantar, Messaoud, Springer (2005).
9. Building Automation Online by McGowan; McGowan, John J.
10. CCTV by Damjanovski, Vlado; Edition: 3 Publisher: Butterworth- Heinemann.
11. CCTV for Security Professionals by Machette, Alan; Matchett, Alan R.; Butterworth-Heinemann (2003).
12. CCTV Surveillance: Analog and Digital Video Practices and Technology by Kruegle, Herman, 2nd Edition, Butterworth- Heinemann (2006).

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 6	6	3	18
2	Seminar/Presentation of Module 1 - 6	1	10	10
3	Site Visit Reports of Module 1 - 3 & 4 - 6	2	3.5	7
			TOTAL	35

B. ARCH. SEMESTER – VI
RAR – 607, HISTORY OF ARCHITECTURE – V

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- Understanding of the period in terms of its location, climate as well as the social cultural, historical, economic and political influences of the time.
- Study of the different building and the development of architectural form and character based on the developments in construction and technology exemplified through specific building examples that identify the works of the period.
- Understanding the intentions of the period and architects as a solution to the need or demands of the period.

Module-1	**Picturesque and Neo- classical architecture:**	Purity and structural honesty of antiquity preferred over ornamentation and exaggeration of Baroque. Representation of ancient Roman monuments in imaginary compositions. Archeological purism and importance of pictorial values in historical settings. Recreation of antique Roman simplicity and splendor for modern living. Study of important palaces and public buildings in Britain and France.
Module-2	**Enlightenment and beginnings of Modern :**	Belief in creation of 'new' and 'ideal' world through return to fundamentals, 'true' and 'original' values. Romanticizing elementary geometrical forms with undecorated surfaces. Iron and glass construction for openness and lightness: Art Nouveau. Repetitive, Orthogonal, skeletal systems for horizontal and vertical expansion. Latter attempts to dissociate references to past styles.
Module-3	**Modern Architecture:**	Social intentions and search for ideal world. Pluralism in place of past unity of styles. Search for paradigms in historical sources: It return to fundamentals and origins in geometry, nature and paradigms of technology. Expressions of construction and technology. Equating technology and progress with present. Functionalism and functional appropriateness. Thoughts and works of frank Lloyd Wright, Walter Groupies, Le Corbusier, Mies van der Rohe, Alvar Aalto, Louis Kahn, Dutch De Stijl Italian futurists and Russian Constructivists. International style: Oversimplification of the modern Movement into functional, steel and glass, cubes. Monotonous functionalist abstractions and Modernism as a style. Disenchantment of modern cities and fall of modern Movement.
Module4	**Post Modern Architecture:**	Post Modern Architecture as a revision of Modern architecture and resistance to functional containers of 60's. Objective, representational and emphasis on content. Pluralistic and differing trends.
Module-5	**Post Modern – Historicism:**	Rooted to place and history. Regards of expression: ornaments, symbolism and context with irony and humour, exemplified through the works of James Stirling, Michael Graves, Charles Moore, AarataIsozaki.
Module-6	**Neo- Modern:**	Disregard historical imaginary to recapture ideas for modern architecture of 20's. Hi-tech metal abstractions of Richard Rogers, Normal Foster, showing structure and equipment as implied ornament. References of Russian Constructivists. The early works of New York Five including later works of RicharMier as

complicated, exaggerated and sophisticated revival of the modern grid and Corbusier's geometry. Synthesis of Hi-Tech and Historicism in the works Aldo Rossi, Mario Botta, Cesar Pelli.

Module-7 Deconstructive: Narrative and representational. Sources in Russian Constructivism. Non perfection in the works of Frank Gehry, Peter Eisenman, Bernard Tschumi, Daniel Libeskind, questioning traditional purity of form, geometry and structure.

REFERENCE BOOKS

1. Kenneth Frampton, "Modern Architecture; A Critical History" by, Tames and Hudson
2. Willam Jr.Curtis, "Modern Architecture since 1900", Phaidol
3. Sir Banister Fletcher, A History of Architecture, University of London, The AntholonePress, 1996.
4. Spiro Kostof - A History of Architecture - Setting and Rituals, Oxford UniversityPress, London, 1985.
5. Leland M Roth; Understanding Architecture: Its elements, history and meaning; CraftsmanHouse; 1994
6. Pier Luigi Nervi, General Editor - History of World Architecture - Series, Harry N.Abrams,
7. Inc.Pub., New York, 1972.
8. S.Lloyd and H.W.Muller, History of World Architecture - Series, Faber and Faber Ltd.,
9. London, 1986.
10. Gosta,E.Samdstrp, Man the Builder, Mc.Graw Hill Book Company, New York, 1970.
11. Webb and Schaeffer; Western Civilisation Volume I; VNR: NY: 1962
12. Vincent Scully: Architecture; Architecture – The Natural and the Man Made: Harper Collins Pub: 1991.
13. Charles Jencks, "The language of Post Modern Architecture".
14. Heinrich Clotz, "History of Post Modern Architecture".
15. Marvin Trastctenberg, " Architecture from Prehistory to Post modernism"

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheets/Sketches of Module 1 - 7	7	2	14
2	Tutorial/Quiz of Module 1 - 7	7	2	14
3	Seminar / Presentation of Module 1 - 7	1	7	7
			TOTAL	35

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VI
RAR – 608, RESEARCH / SEMINAR / WORKSHOP - V

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	0	0	**0**	**50**	1	-

OBJECTIVES

- Understanding basic principles of any research with special reference to architectural research and applications.
- To write a technical paper of about 5000 words with original input.

Module-1	**Introduction**	Learning the formulation of research question or hypothesis
Module-2	**Writing a technical paper**	Writing a paper of 5000 words in following stages: Formulation of an original research issue by ascertaining the gaps in research Synopsis with clear heads of Intent, Background, Aims and Objectives, Scope, Methodology. Structuring the body of the paper in detail Ascertaining Primary and Secondary Sources Referencing in Harvard Style Utilizing the sources to reach to the desired objectives Editing the paper

LIST OF ASSIGNMENTS

1. Writing a paper of 5000 words. This should be broken down stage wise and a feedback be given at every stage.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford UniversityPress, New Delhi.
2. Kate L.Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition.
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module - 1**	**1**	**5**	**5**
2	**Tutorial of Module - 2**	**1**	**30**	**30**
			TOTAL	**35**

B. ARCH. SEMESTER – VI
RAR – 609, BUILDING ECONOMICS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.

OBJECTIVES

- To develop an understanding among the students regarding management of physical and human resources including evaluation techniques pertaining to a business organization in general and specific to construction industry.

Module-1	**Elementary concepts of Economics**	Introduction to Economics- Definitions, Needs& Wants, Nature & Scope of Economics. Division of economics – MicroEconomics-Scarcity, Utility - Marginal, Total& Average.Laws of Demand and Supply. Macro Economics-Economic system in India.
Module-2	**Economics in relation to Architecture, Engineering and other sciences**	Meaning and scope of building economics, Issues and challenges associated with building projects. Building Efficiency, BuildingLife-cycle. Costs and Benefits of Building – Monetaryand Non Monetary.
Module-3	**Project Financing**	Equity, Financing Institutions in Financing Process, Interim Finance and Permanent Financing, BankLoan - Simple Interest and Compound Interest. Types of Mortgage, Lease Arrangements.
Module-4	**Economic performance of building**	Decision Making using techniques of economic performance to measure tangible and non-tangible issues - Cost-Benefit Analysis, Incremental Analysis and Multi-criteria Analysis.

REFERENCE BOOKS

1. Modern Economic theory - K.K. Dewett.
2. Economic for Engineers – M.L. Gupta.
3. Micro – economic theory – Samuelson.
4. Building Economics for Architects – T. Mann.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 4**	**8**	**3**	**24**
2	**Seminar/Presentation of Module 1 - 4**	**1**	**11**	**11**
			TOTAL	**35**

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VII
RAR – 701, PRACTICAL TRAINING

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
0	0	0	0	400	**400**	0	400	**400**	**800**	20	X	X

INTRODUCTION

A. TRAINING RULES:

Extracts from Ordinances, Scheme of Examination & Syllabus:
(For the award of the degree of B. Architecture by the Dr. A.P.J. Abdul Kalam Technical University. Lucknow)

Ordinance 16 PRACTICAL TRAINING:

16.1 Each student will be required to proceed on 'Practical Training' for the VII semester after appearing at the VI semester examination. The Principal/Head of Department of Architecture of the concerned Institute will approve the office of the 'Practical-Training' for the student.

16.2 The marks for 'Practical Training' will be awarded to each student in accordance with the Regulations and Guidelines issued separately by the Dr. A.P.J. Abdul KalamTechnical University.

B. AIMS OF PRACTICAL TRAINING:

1. The aim of the 'Practical Training' is to enable the students to gain the kind and range of practical experience which will prepare them for their likely responsibilities, immediately after qualifying B. Arch. Course.

2. The 'Practical Training' should be regarded as an important academic activity. Howsoever good the arrangement of training may be, the trainee student, still, has the responsibility to use his own initiative in making the best use of the opportunities which he/she gets during training period and prepare himself/herself for the profession.

3. The student should try to seek a variety of experiences in his/her 'Training office' to acquaint himself/herself with various works, procedures etc. of building trade.

GUIDELINES FOR STUDENT TRAINEE

1. **Criteria for selection of a Training Office**
   - In case of proprietorship firm, the proprietor shall be an architect; also, the firm shall have at least two or more architects as employee/associates.
   - In case of 'Partnership' / 'Pvt. Ltd.' Firms, at least one of the partner/director shall be an architect, and the firm shall have at least one or more architects as Partner/director/employee/ associate.
   - In case of a 'Public-sector' / 'State or Central Government office/ Academic institute or a multinational organization', there shall be a separate wing for architectural consultancy works.
   - The said architect (Proprietor/Partner/Director/Head of Department/Chief Architect etc.) shall have at least 10 years of working experience and the organization should have a variety of projects.

2. **Working Relationship between Architect and Trainee**
   - The architect shall provide enough jobs to the trainee to keep him/her occupied.
   - The Architect shall expose the trainee to difference aspects of professional practice. The tasks given to the trainee shall include the following-

   - **Preparation of**
     - Sketch designs, presentation drawings etc.
     - Municipal drawings according to the byelaws.
     - Workings drawings and details.
     - Estimates, bill of quantities & specifications.

- **Discussions with**
  - Clients.
  - Structural Consultants.
  - Services Consultants.
- **Inspection and management of site.**
- **Preparation of**
  - Models, perspectives and photographs.
  - Reports, progress charts etc.
- **Other administrative works.**

3. Honorarium/Stipend

- The architects usually pay some amount as honorarium/stipend to meet out of pocket expenditure to the trainee. The Institute/College of the student shall have no objection if the trainees accept/receive such honorarium/stipend.
- The mode and amount of the honorarium shall depend upon the office and be based upon a mutual agreement between the employing architect and the trainee. However it shall neither be a claim of the trainee nor binding on the architect but in order of professionalism and to maintain the dignity of profession, the training office of architects pay a respectable amount as stipend/honorarium.
- The Institute/Training and Placement cell of the Institute shall not in any way be responsible for the payment against any sorts of damages, whatsoever.

4. Code of conduct for the trainee

- He/she shall abide by the rules, regulations and general instructions of the office/firm.
- He/she shall remain punctual and regular in attendance.
- He/she shall make all efforts to learn the work involved in the profession, and if so required for work, shall attend the office beyond the scheduled time in the office.
- He/she shall respect and obey the senior members of the office/firm.
- He/she shall take up the job with full responsibility and show utmost interest in the work allotted.
- He/she shall inform the institute/training and placement cell about joining in the training office, its address and contact numbers. He/she shall also inform the address of the accommodation acquired during the training period.
- He/she shall remain in regular touch with the institute/'Training and Placement Cell' and shall keep the Training and Placement Cell fully informed about his/her progress in the training office.
- In case of any complaint or misconduct, the Institute/Training and Placement Cell may take suitable and strict action against the student

5. Arranging/Fixing-up the Training office

- The Department / Faculty of Architecture, directly or through the 'Training and Placement Cell' of the Institute shall provide a list of offices, along with their addresses of some well-established and recognized architects. Addition, alteration and deletion in such a list may be made from time to time in conformity to 'Criteria' as laid down for selection of a training office.
- After seeking advice from 'Training and Placement Cell', the student shall make his/her options available to the Training and Placement Cell.
- With the help of 'Training and Placement Cell', the student shall make all efforts to settle his/her appointment as trainee with an established and recognized architect.

6. Duration of Practical Training

- The duration of practical training is equivalent to a semester. The dates to start and finish the practical training shall coincide with the starting and finishing dates of the respective semester, in accordance to academic calendar of *Dr. A.P.J. Abdul Kalam Technical University. Lucknow.* However, the candidate can start his/her practical training before the said schedule i.e. during summer vacations.

7. Joining and Leaving the Training Office

- The trainee is expected to join the training office on the scheduled date, and submit his **'Joining Report'** on the letterhead of the office duly signed by Head of the Training to the Institute in the Performa prescribed for the purpose and contained in the Log Book.
- The trainee must obtain a '**No DuesCertificate'** duly signed by Head of the Training and get relived from the office at the end of the training period or before changing the 'Training Office'. The trainee must submit this **'No Dues Certificate'** along with the **Log Book.**

8. Change of Training Office

- In case of any emergency, a trainee may be permitted to change the training office/place of training once only during the entire period of training. He/she shall inform the Principal/Director/Head of Department/Officer in-charge of the 'Training and Placement Cell', and seek prior permission for such a change.
- The total duration of the practical training shall be the sum of the period of stay in different offices. It shall be in conformity with the 'Duration of Training' as prescribed in the 'Ordinances, Scheme of Examination & Syllabus' of the Dr. A.P.J. Abdul KalamTechnical University.

9. Final Submissions

After completion of practical training, the trainee is required to submit the following to the parent Institute.

- 'Certificate' of successful completion of the practical training, from the architect, in two original copies.
- 'Daily Diary' with details of the day to day work record, which will be returned to the student after assessment and viva voce examination.
- 'Log-Book' in the prescribed format, duly filled up and signed by the 'Supervisor'.
- 'Training report' supplemented with the prints and documents of work done during practical training. The prints and documents shall be obtained with the permission of the Training office and shall be duly signed by the 'Supervisor'.
- Training report shall be submitted in two original copies. One copy shall be returned to the student after assessment of sessional marks and viva voce examination. The second copy shall be retained by the Training and Placement Cell/library. These shall be presented in A-3 size with ring binding.

10. Failures

- In case the student/trainee remains unsuccessful or fails in completing his/her practical training or viva-voce examination, the matter shall be dealt with in accordance with the relevant 'Rules and Regulations' of the Dr. A.P.J. Abdul Kalam Technical University.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION / SESSIONAL OF PRACTICAL TRAINING

- Practical training shall be evaluated internally by a panel, by questioning the candidate. The panel shall consist of at least two senior faculty members (Architect) and Practical Training Coordinator in addition. The assessment shall be made out of 300 marks (250 marks for Training report, 30 marks for Log-Book and 20 marks for Daily Diary) by the panel.
  In case of more than one section, in the Institute, there can be equivalent numbers of panel. In this case the panel shall consist of at least two senior faculty members (Architects) and Practical Training Co- coordinator / Asst. Practical Training Coordinator in addition.
- An assessment report (confidential) having a weightage of 100 marks out of the whole sessional marks, shall be obtained on a prescribed format (available on web site), from the training office. The report should be signed by the head of respective office.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF PRACTICAL TRAINING

EXAMINERS –

Each panel shall consist of -

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution /university.
- A faculty member (Architect) of the parent institution /university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution /university.
- An Eminent Architect from the profession with at least 15 years of field experience.

Kindly note that opportunity to evaluate a candidate shall be given once to a faculty member, in the semester i.e. either in jury panel of internal or final evaluation.

Further the Practical Training Coordinator(s) will act as facilitator.

B. ARCH. SEMESTER – VII
RAR – 702,SEMINAR / PRESENTATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
0	0	0	0	100	**100**	0	100	**100**	**200**	4	X	X

OBJECTIVES

The presentation in this course shall cover, over and above the regular work done (in RAR - 701) by the trainee during the training period. It shall fulfillthe following objectives -

- To make trainees understand and feel the importance of observation of Buildings of Importance, Histotical places, Areas of prominence etc. within the city and nearby areas of training. The trainees shall present it through travelogue, photographs, measure drawings etc.
- To attend Conferences, Seminars, Workshops, Exhibitions etc. related to field of architecture during their period of training.
- To make students experience the issues related to Site Supervision and Execution through interactive outcomes with masons, site supervisors, vendors and other related professionals.

The trainee is expected to accomplish all the above three objectives during training period along with the period of summer- break.

SUBMISSIONS

After completion of practical training, the trainee is required to present / submit the following to the parent Institute / university.

- All relevant drawings / sketches, site measures etc. as .jpeg image incorporated in power point format. The travelogue both in soft and hard copies in two numbers.
- Brochure / Study material etc. of Conferences, Seminars, Workshops, Exhibitions etc. attended in two sets.
- Diary, where interactive out comes at site is noted down, along with photographs of site visits in one set.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION / SESSIONAL OF SEMINAR / PRESENTATION

Seminar / Presentation shall be evaluated internally by a panel, by questioning the candidate. The panel shall consist of at least two senior faculty members (Architect) and Practical Training Coordinator in addition. The assessment shall be made out of 100 marksby the panel.

In case of more than one section, in the Institute, there can be equivalent numbers of panel. In this case the panel shall consist of at least two senior faculty members (Architects) and Practical Training Co- coordinator / Asst. Practical Training Coordinator in addition.

COMPOSITION OF JURY PANEL FOR FINAL EVALUATION / EXAMINATION OF SEMINAR / PRESENTATION

EXAMINERS –

Each panel shall consist of -

- An Architect Director / Dean / Principal / Head of the Department / Professor of the parent institution / university.
- A faculty member (Architect) of the parent institution /university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution /university.
- An Eminent Architect from the profession with at least 15 years of field experience.

Kindly note that opportunity to evaluate a candidate shall be given once to a faculty member, in the semester i.e. either in jury panel of internal or final evaluation.

Further the Practical Training Coordinator(s) will act as facilitator.

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – VIII
NAR – 801, ARCHITECTURAL DESIGN - VII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	8	30	70	**100**	75	25	**100**	**200**	7	6+6+6 HRS	7 HRS

OBJECTIVES

- Understanding design as a process of problem identification, space standards, formulation of requirements, evolution of design criteria and development of design of buildings in urban context, phasing and development.
- Understanding relationship of buildings amongst themselves and with a given environment.
- Incorporating the agenda of building bye laws, structure, site planning and landscape and services within existing context.

Module-1	**Introduction**	Understanding the importance of 'context' and built urban environment in design and lessons to be learnt in contextual insertions.
Module-2	**Study and Analysis**	Examining an existing urban environment for establishing parameters that influence contextual insertion within that fabric.
Module-3	**Design Proposal**	Design of multi-utility buildings /campus / complexes incorporating the constraints derived from the context it is placed in.

SUGGESTED STUDIO EXCERCISES

1. Study of a given urban fabric with underlying context.
2. Urban Intervention Projects: Design of buildings / building complexes in specific urban contexts such as heritage zones, near existing and within built environments.
3. Development of projects containing group of buildings with multiplicity of constraints such as relationship of land uses, space, architectural character, circulation, movement landscape and buildings.
4. The exercises such as redevelopment and urban improvement projects shall be generated after understanding the existing physical, socio-cultural, economic and political context surrounding activities etc.

APPROACH

- Design methodology shall take precedence over design.
- Model of existing site and context shall be prerequisite for design insertions.
- Part of project may be done in groups to develop teamwork and multi-faceted approach to design.

REFERENCE BOOKS

1. Architecture Today.
2. Concept to the manifest.
3. Projects of various Architects of similar nature.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Seminar / Presentation / Site Report of Module - 1**	**1**	**5**	**5**
2	**Detailed Study of Existing Urban Fabric with Model(s) Developing the Context where Insertion is to be done of Module - 2**	**5**	**5**	**25**
3	**Design Exercises (Major) with Models of Module - 3**	**2**	**20**	**40**
			TOTAL	**70**

B. ARCH. SEMESTER – VIII
RAR – 802,CONSTRUCTION & MATERIALS – VII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS	3 HRS

OBJECTIVES

- To introduce and familiarize the students with the usage of various metal/gypsum board partitions and false ceilings construction works.
- To introduce and familiarize the students with the various asbestos cement products for construction works.
- To introduce and familiarize the students with the various water proofing compounds used in construction works.
- To introduce and familiarize the students with the usage of various Plastics and Rubbers in construction works.
- To study the causes and remedies of various defects in existing and new construction.
- To familiarize the student with the advanced building construction practices on site.

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SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	**Gypsum & Asbestos Products**	Introduction - Gypsum Board, Suspended Ceiling (Board & Tiles), Gypsum Plaster, Components and Accessories. Jointing and Finishing. Understanding of various Asbestos Cement products available for application in building industry.
Module-2	**Water Proofing Compounds**	Various waterproofing compounds - Neoprene, Butyl, EPDM, PVC, Polyurethene.
Module-3	**Plastics and Rubbers**	Thermoplastics - Polythene, Polyvinyl chloride, Poly-propylene, Polymethyl methacrylate, Acrylonitrile butadiene styrene. Thermosetting Plastics – Phenol formaldehyde, Urea formaldehyde, Melamine formaldehyde, Polyurethane, Siliconc resin. Rubber.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit gypsum, asbestos, plasticfactory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4	**Workshop/Construction Yard Practice**	Practicing in construction yard by making the examples of Gypsum board partition & false ceiling, P.V.C. doors and windows.
Module-5	**Site Exposure**	Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in precast works.
2. To construct examples of precast works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6	**Partitions & False Ceilings (Gypsum Board)**	Construction details of Metal Stud Partition (single layer). Construction details of Suspended Ceilings
Module-7	**Water Proofing Works**	Basements, Toilets, Kitchens, Terrace gardens. Expansion joints.
Module-8	**Joints**	Special Construction joints. Seismic joints.
Module-9	**Doors & Windows**	Door Frame and Shutters. Windows Frames and Shutters.

(P. V. C.)

Module-10	**Defects and Remedies**	The study of various defects in buildings and their remedies. Defects caused by dampness, applied forces and changes in size.

`CONSTRUCTION PLATES

1. To understand the application of gypsum board in metal stud partitions in building.
2. To understand the application of gypsum board in suspended / false ceilings in building.
3. To understand the application of water proofing works in building.
4. To understand the application of construction and seismic joints in building.
5. To understand the application of P.V.C. Doors.
6. To understand the causes and remedies of various defects in existing and new construction.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra &Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell's Structure & Fabric-II
10. Prestressed Concrete Structures: P. Dayaratnam
11. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
12. Properties of Concrete A. M. Neville
13. Concrete Admixture Handbook: Properties, Science & V. S. Ramchandran Technology
14. Modern Prestressed Concrete: J. R. Libby
15. Principle & Practices of Heavy Construction: Smith & Andres
16. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
17. Building Materials by SC Rangwala: Charotar Pub. House, Anand
18. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
19. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
20. National Building Code of India (Latest Edition), Bureau of Indian Standards.
21. Engineering Materials-Deshpande.
22. Engineering Material-Roy Chowdary
23. Designing with models – Criss. B. Mills.
24. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
25. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
26. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
27. Wenninger (Magrus.J.) Spherical Models, Cambridge University Press, 1979
28. Testing of Concrete in Structures J H Bungey and S. G. Millard
29. Non-destructive testing V. M. Malhotra
30. Learning from failure – deficiencies in Design, Construction and Service R N Raikar
31. Concrete: Repair and Maintenance Illustrated, Problem Analysis, Repair strategy and Techniques Peter Emons & Gajanan Sabnis
32. Construction Failure Jacob Feld, Kennith Harper.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey & Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – VIII
RAR – 803, ARCHITECTURAL STRUCTURES - VII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS	3 HRS

OBJECTIVES

- To understand the reinforcement cement concrete design of structural elements

Module-1	**Analysis & Design of Roof Trusses (Steel)**	Introduction and terminology of Roof Trusses, Types of Trusses, Analysis and design of Roof Truss (Fan Type) in Steel.
Module-2	**Analysis & Design of Raft Foundation (R.C.C.)**	Introduction and need of Raft foundation. Analysis and design in R.C.C.
Module-3	**Analysis & Design of Shell Structures (R.C.C.)**	Introduction to various types of shell structures. Analysis and design of shell structure (Hemi-spherical Dome) in R.C.C.
Module-4	**Analysis and design of Pre Stressed Concrete**	Introduction, Element of pre stressed concrete, Advantages and disadvantages of prestressed concrete, Reinforced concrete versus prestressed concrete, General Principles of prestressing concrete member and Systems of prestressing, Loss of prestress. Analysis and design of prestress concrete beam.
Module-5	**MultistoriedBuildings**	Introduction, Structural systems, Stiffening elements, Need for redundancy, Regularity, Member stiffness, Loads (Dead loads, Live loads, Wind loads), Approximate analysis for vertical loads and lateral loads, Effect of sequence of construction, Partition walls or infill walls, Coupling effect in buildings, Effect of joint width, Beam to column joint. Introduction to various loads resisting system.

APPROACH

- Lectures by Experts in the field of Design and analysis will be arranged to make the student's exposure to practical aspects of design.

REFERENCE BOOKS

1. Reinforced Concrete Design- AK. Jain.
2. Earthquake Resistant Design of Structures- Manish Shrikhande and Pankaj Agarwal.
3. Advance reinforced concrete design – P.C.Varghese.
4. Structural Design & Drawing Reinforced Concrete & Steel – N Krishna Raju
5. Steel Structures Design & Drawing – Prof. Harbhajan Singh Col. (Retd.)

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	**5**	**7**	**35**
			TOTAL	**35**

B. ARCH. SEMESTER – VIII
RAR – 804, TOWN PLANNING

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	3	3 HRS	3 HRS

OBJECTIVES

- To develop an appreciation of the planning issues involved at the scale of a town or a city.
- To expose the students to the history and development of planning, its relevance & application to modern day principles of town planning.

Module 1	**Introduction to Town Planning & Theories**	Definitions of town planning, form of planning, Elements and planning principal of city plan, Shapes of plan in accordance to road networks. Introduction to basic planning theories Indus Valley, Ancient (Vedic) planning systems.
Module 2	**Planning Concepts and Evolution**	Planning concepts related to City beautiful movement (Chicago, Chandigarh), Urban Utopia (Broadacre), Garden city (Letchworth), Radburn Theory (Radburn) and Neighbourhood planning.
Module 3	**Planning Process & Standards**	Understanding of planning process. Relevance of standards in planning as per URDPFI guidelines prepared by TCPO.
Module 4	**Roads and Traffic Studies**	Awareness of concepts related to various traffic problems in India. Understanding of PCU, Traffic volume, Road capacities, Road types; their sections and intersections, Traffic calming as per IRC guidelines.
Module 5	**Modern Transportation Systems**	New concepts in mass and rapid transportation systems e.g. BRT, LRT and Metro rail.
Module 6	**Modern Approach in Planning**	Introduction, Benefits and Planning components of Green City (e.g. Vancouver), Compact City (e.g. Sky city, China) and Smart City (e.g. Malta)

REFERENCE BOOKS

1. John Ratcliffe, An Introduction to Town and Country Planning, Hutchinson 1981
2. Arthur B. Gallion and Simon Eisner, The Urban Pattern – City planning and Design, Van Nostrand Reinhold company
3. Rangwala, Town Planning, Charotar publishing house
4. G.K.Hiraskar, Town Planning
5. Rame Gowda, Urban and Regional planning
6. V.N.Ambedkar, Town and country planning and Housing, orient longman, 1971
7. URDPFI Guidelines for Planning by TCPO.
8. IRC Guidelines.
9. Abir Bandhopadhyay, Town Planning.
10. Binode Behari Dutt, Town Planning in Ancient India.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 2 - 6**	**5**	**5**	**25**
2	**Seminar/Presentation of Module 1**	**1**	**10**	**10**

			TOTAL	**35**

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED)); A–GRAPHIC DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- Demonstrate a thorough understanding of the elements of graphic design.
- Read, understand and communicate in the language of graphic design.
- Use technology such as Photoshop, Illustrator, Corel Draw and Internet Explorer.

Module-1 Introduction to the Graphic Design	History of Graphic Design, Future of Graphic Design.
Module-2 Basic Design	Development of aesthetic sensibility towards design. Elements and principles of design.
Module-3 Calligraphy and Typography	Anatomy of a letter, Typefaces, Typographic measurement, Typographic standards, Typographic guidelines
Module-4 Creating Images for Print & Web	Formats, Resolution, Raster Vs Vector. Ethics and Copyright laws. Use of particular image formats for individual projects to create collages, logos, cd covers, etc. with the help of Photoshop. Corel Draw and illustrator software. Images scanned from the internet to create projects while learning to cite sources.

APPROACH

- In teams students create a business proposal and create branding for that business including a commercial and magazine ad. They present the product to all students.

REFERENCE BOOKS

1. Stuart Trolley, Min: The New Simplicity in Graphic Design, 1960
2. John Krull, Graphis Design Annual, 2017
3. Timothy Samara,Making and Breaking the Grid, Second Edition, Updated and Expanded: A Graphic Design Layout Workshop.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 3**	**3**	**10**	**30**
2	**Seminar/Presentation of Module 1 - 3**	**1**	**20**	**20**
3	**Hands on – Branding proposal of Module 4**	**1**	**20**	**20**
			TOTAL	**70**

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED)); B–CERAMICS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- To understand the versatility of clay, as a materials.
- To introduce ceramics, thereby creating various forms/pots while doing hands-on exercises.

Module-1	**Study of Various Types of Clay**	Clay body making, building shapes by coil & slab. Practice & throwing on wheel. Simple glazes.
Module-2	**Preparing Different Clay Bodies**	Creating three dimensional forms with the help of potter's wheel. Methods of Biscuit firing. Glaze making & glaze firing.
Module-3	**Callographs**	Round & relief shapes by coil, Slab moulding and wheel work. Moulding & casting tile making. Biscuiting and glaze firing.
Module-4	**Pottery**	Pots and shapes made by coil method. Pot making by throwing on potter's wheel (elementary)

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Study Model of Module 1 - 3**	**3**	**10**	**30**
2	**Seminar/Presentation of Module 1 - 3**	**1**	**20**	**20**
3	**Hands on – Productout of Clay of Module 4**	**1**	**20**	**20**
			TOTAL	**70**

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED)); C–ADVANCED MODEL MAKING

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- To introduce model making as a generative process, a tool in Design generation.
- To inculcate the dynamic act of model making in thinking process.
- To explore conventional and less conventional techniques of representation in an attempt to creative visualization and to understand drawings as vehicles of thinking.
- To understand the versatility in making models ranging from study to presentation and in varying scales and materials.

Module-1 Surface Development
Methods of surface development by Parallel-line, Radial-line, Triangulation methods, approximate methods, development of lateral surfaces of right solids, viz. Cubes, prisms, cylinders, pyramids, cones. Development of transition pieces, for spheres etc. Paper folding – Origami.

Module-2 Model Making Techniques
Generative / geometry, fractals, parametric / material explorations (both in traditional materials like mount, foam, thermacol, clay, plaster of Paris, paper Mache, wood and new age materials like polystyrene, Aerocon blocks, plastics, meshes, and processes like carpentry, casting, moulding, welding ,laser cutting, CNC cutting etc.

Module-3 Use of Advanced Tools and Materials
Painting model surfaces with various finishes, development of topography and landscape elements, use of materials like cork, polyurethane foam, use of laser, acid etching, stereolithographic (3D printing) for development of building and their envelopes.

Module-4 Presentation Models
Skills to use the tools with precision, Techniques for preparation of presentation models. General information and practice with different finishing material. Exercises involving topography, textures, landscapes, human elements etc.

APPROACH

- Students are made to explore a variety of tools and software that are available for the design process, which includes form exploration, modeling, and producing drawings. For Project students will be asked to develop digital generative drawings and then encouraged to develop their abilities in modeling their designs.

REFERENCE BOOKS

1. Werner, M. (2011). Model Making. New York: Princeton Architectural Press.
2. Jannsen, Constructional Drawings & Architectural models, Kari Kramer Verlag Stuttgart, 1973.
3. Harry W.Smith, The art of making furniture in miniature, E.P.Duttor Inc., New York, 1982.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial/Study Model of Module 1 - 3**	**3**	**10**	**30**
2	**Seminar/Presentation of Module 1 - 3**	**1**	**20**	**20**
3	**Hands on – Installation**	**1**	**20**	**20**

	(Outdoor/Indoor) of Module 4			
			TOTAL	**70**

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED)); D–PHOTOGRAPHY

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- To impart the skills of taking aesthetically appealing and creative architectural photographs through the use of appropriate cameras / lenses and lighting conditions.

Module-1 Introduction — Introduction to architectural photography. Various types of compositions framing, silhouette photography.

Module-2 Types of Camera — Use of various cameras, lenses and accessories, handling of equipment.
SLR, DSLR cameras, lenses for different focal lengths for various contexts.
Use of wide angle, normal, tele, zoom, macro, close up lenses.
Filters-UV, Skylight, colour filters, special effect filter.
Shutter speeds - slow, normal and high and their various applications.
Apertures - use of various apertures to suit different lighting conditions and to enhance depth of fields.

Module-3 Architectural Photography — Optimizing selection of shutter speed, aperture and ISO. Twilight and night photography.
Various uses of photography - documentation, presentations, competitions, lecture etc.
Architectural Photography, Exterior and Interior photography.
Practical exercises to understand composition.

Module-4 Photographic Documentation — Creative photography / photo renderings for special effects using software.
Play of light and shadows to achieve dramatic pictures. Effects of seasons, inclusion of greenery, foliage, clouds, human scale etc.
Photo documentation of buildings highlighting quality of architectural elements and spaces.

APPROACH

- A teacher should give an intensive introduction to photography including darkroom techniques to develop visual perception through observation, composition, colour and light interaction, shades, as well as positive/negative space relationships.

REFERENCE BOOKS

1. Schulz, Adrian. Architectural Photography: Composition, Capture, and Digital Image Processing, Rocky Nook, 2012.
2. McGrath, Norman . Photographing Buildings Inside and Out, Watson-Guptill Publications, 1993.
3. Harris, M. (2002). Professional Interior Photography. Focal Press.
4. Heinrich, M. (2008). Basics Architectural photography. Bikhauser Verlag AG

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 3**	**3**	**10**	**30**
2	**Seminar/Presentation of Module 1 - 3**	**1**	**20**	**20**

3	Hands on – Photographic documentation of any Building of Importance of Module 4	1	20	20
			TOTAL	70

B. ARCH. SEMESTER – VIII
RAR – 805, ELECTIVE – I (SKILL BASED)); E–PARAMETRIC DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- To understand the recent development of parametric design in architecture both as a discourse and as a tool.
- To provide a brief yet systematic conceptual framework to parametric design in contemporary architectural practices.
- To develop in students' basic skills in using parametric tools such as Grasshopper, Dynamo.

Module-1	**Elements of Parametric Design and Design Patterns**	Introduction to Parametric design, Historical development of parametric design, The structure of parametric design processes, their characteristics and reusable parametric design approaches
Module-2	**Fundamental Concepts of Geometric Modeling**	Spatial coordinates, Projections, Boolean operations, Formal transformations, Freeform surface creation, Surface development and deformations aimed at architecture applications, Discretization and meshing, Digital prototyping and geometry reconstruction. Concepts in computational geometry applied to parametric architectural geometry modeling.
Module-3	**Parametric Modeling Techniques and Tools**	Introduction of tools for model design parametrically to illustrate the construction of geometrical relationships among complex shapes. Focus on hands-on techniques that can be applied to the design process, to extend the efficiency and productivity of work during the process. Use of softwares like Rhino, Grasshopper, Kangaroo, Revit and Dynamo.
Module-4	**Digital Fabrication**	Using 3D digital modeling to efficiently produce components without the need for 2D representation.
Module-5	**Parametric Design & Environment**	Use of Ladybird and honeybee plugins for simulation.

APPROACH

- Through the combination of lectures, hands-on workshops and project-based seminars

REFERENCE BOOKS

1. Gips, James. "Computer implementation of shape grammars." In NSF/MIT workshop on shape computation, vol. 55, p. 56. Cambridge, MA: Massachusetts Institute of Technology, 1999.
2. Piker, Daniel. "Kangaroo: form finding with computational physics." Architectural Design 83, no. 2 (2013): 136-137.
3. Ingels, Bjarke. Hot to cold: an odyssey of architectural adaptation. No. 72: 504 72: MedioAmbiente. BIG Bjarke Ingels Group., 2015.
4. Schumacher, Patrik. "Parametricism: A new global style for architecture and urban design." Architectural Design 79, no. 4 (2009): 14-23.
5. Sakamoto, Tomoko, ed. From control to design: parametric/algorithmic architecture. Actar-D, 2008.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial / Digital Modellingof Module 1 - 3	3	10	30

2	**Seminar/Presentation of Module 1 - 3**	**1**	**20**	**20**
3	**Hands on – Digital Fabrication of Module 4**	**1**	**20**	**20**
			TOTAL	**70**

B. ARCH. SEMESTER – VIII

RAR – 805, ELECTIVE – I (SKILL BASED)); F–ALTERNATE BUILDING TECHNIQUES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	2	X	X

OBJECTIVES

- To enable the students to understand the alternative building techniques other than conventional ones with relation to economic and environmental outcomes.

Module-1 Introduction — Types of alternative building techniques like, Earth, Flyash, Bamboo, Thatch, Ferro-cement, etc. Advantages of alternative building techniques over conventional methods. Alternative methods of construction related to different materials and their comparison. Upgradation, modification and revision of various methods of construction

Module-2 Earth — Components of earth: gravel, sand, silt and clay. Characteristics, advantages and disadvantages, needs and usage of various methods of construction like walling, flooring and roofing techniques. Composite materials made from earth like rammed earth, compressed stabilised earth blocks, stacked earth, sun dried clay bricks, steam cured blocks, Wattle and Daub.
Filler slab, Jack arch roof.

Module-3 Bamboo — Characteristics, advantages and disadvantages, needs and usage of various methods of construction like walling, flooring and roofing techniques. Preservation of bamboo, bamboo tiles, shingles, bamboo joints.

Module-4 Recycled Waste Materials — Types of waste used in construction. Benefits of using recycled waste materials. Materials made out from waste paper, wood, plastic bottles, plastic bags, earthen materials, steel, aluminium, copper, bricks, gypsum, straw, wool, carptes etc, Techniques of using these materials nin building construction.

APPROACH

- A workshop should be conducted on any of the above mentioned building techniques.

REFERENCE BOOKS

1. Lewis Davidson Gotlieb, Environment and design in housing, The Mc.Millan Corp, New York.
2. Housing and building in hot-humid and hot dry climate/
3. Low-cost housing in developing countries/ Mathur,

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial / Digital Modellingof Module 1 - 4**	**4**	**7.5**	**30**
2	**Seminar/Presentation of Module 1 - 4**	**1**	**20**	**20**
3	**Hands on – Installation (Outdoor/Indoor) of Module 2 -4**	**1**	**20**	**20**
			TOTAL	**70**

B. ARCH. SEMESTER – VIII
RAR – 806, ARCHITECTURAL SERVICES – V (ACOUSTICS)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To understand the basic principles of physics of sound.
- To make them enable to apply the knowledge in various buildings.
- To get familiarized with sound system equipments, available in market.
- To familiarize the student with laws as per National Building Code of India/BIS.

Module-1 Building Acoustics

Introduction -
Terminology and unit.
Characteristics of audible sound – Propagation, Velocity, Frequency, Pitch, Quality/timbre, Loudness andIntensity.
Behavior of audible sound in enclosures – Reflection,Absorption, Diffraction andTransmission of sound.
Common acoustical defectsand recommended remedies–
Echo, Sound foci, Dead spots, Sound shadows, Resonance, Insufficient loudness, External noise and Reverberation.
Sabine's expression for calculation of Reverberation time.
Absorbents and absorption coefficient.
Noise control –
Noise and its types, Noise pollution.
Sources of indoor noise, Indoor noise levels,Planning and design against indoor noise.
Sources of outdoor noise, Traffic noise levels, Planning and design against outdoor (traffic & buildings in built-up area) noise.
Identification of various sources of noise and recommendations to control them in various types of buildings e.g. – Residential, Educational, Hospital, Office, Hotels & Hostels, Industrial, Laboratories & Test houses, Miscellaneous buildings etc.
Constructional measures for sound insulation of buildings –
Materials, Hollow & composite wall construction, Floors&Ceilings.
Properties of good acoustical materials.
Sound system –
Sound reinforcement system, Public address system.
Familiarization and understanding of sound system equipment specification e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.
Acoustical design principles and factors–
Acoustical design principles for Auditoriums, Cinema halls, Conference rooms etc. and factorsviz. Site selection & planning, Dimensions, Shape, Seats & seating arrangements, Treatment of interior surfaces, Reverberation & sound absorption.

SECTION – B, APPLICATION

Module-2 Acoustical Design	The understanding the audio needs and layout for projects e.g. Auditoriums, Cinema halls, Conference rooms etc.
Module-3 Field / Market Surveys	Familiarization and understanding of sound system equipment available in marketmanufactured by various brands e.g. Amplifiers, Microphones, Speakers, Mixers, Conference systems and accessories.

REFERENCE BOOKS

1. National Building Code of India.
2. National Electrical Code.
3. K. A. Siraskar, Acoustics in Building Design, Orient Longman Ltd., 1972.
4. S. Kandaswamy, Architectural Acoustics and Noise Control, Allied publishers Pvt. Ltd., 2005.
5. Catalogues of leading Audio equipments agencies e.g. Philips, Ahuja etc.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1	6	3	18
2	Seminar/Presentation of Module 2	1	10	10
3	Site Visit Reports of Module 3	1	7	7
			TOTAL	35

B. ARCH. SEMESTER – VIII
RAR – 807, THEORY OF ARCHITECTURE

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To provide to students a strong knowledge base on, the various theories and concepts of design and how philosophy and strategies are related to architecture.
- This course aims to evolve a conceptual framework for intelligent appreciation of Architecture and to develop a vocabulary for discussing design ideas at a broader level

Module-1 Pre Modern Antonio Gaudi; Charles Rennie Mackintosh; Antonio Sant'Elia; Adolf Loos; Auguste Perret; Peter Behrens; Bruno Taut; Gerrit Reitveld; Tatlin

Module-2 Modern Gropius; Mies Van der Rohe; Frank Lloyd Wright; Le Corbusier; Alvar Aalto; Terragini; Louis Kahn.

Module-3 Post Modern **Spatial/Deconstruction:** Frank O Gehry, Michael Graves, Peter Eisenman, Moore, Richard Meier, Robert Venturi, Zaha Hadid, Coop Himmelblau, Richard Rogers, Tadao Ando, Rem Koolhas, Herzog and de Meuron, Daniel Libeskind.
Historicism: Michael Graves & Robert Venturi, Bernard Tschumi.
Urbanist: Mario Botta, Aldo Rossi, Cesar Pelli.
Classicists: Arata Isozaki, Michael Graves, Mario Botta.
Revivalists: Louis I Kahn, James Stirling, Charles Gwathmey, Richard Meier.**Vernacular:** Hasan Fathy.
Philosophy: Charles Jencks, Bernard Tschumi, Peter Eisenman, John Hejduk.
Critical Regionalism: Charles Correa, B.V Doshi, Tadao.
Materialist: Peter Zumthor.

APPROACH

Through the presentation of the work of the architects from Pre Modern, Modern and Post Modern, the students have to trace their ideology, their philosophical attitudes and the theories that may have contributed to their evolution. The architect may be associated with a theoretical movement or group, which needs to be highlighted through models, sketches and design assignments emphasizing the philosophy or style.

REFERENCE BOOKS

1. Pattern language-Christopher Alexander
2. The language of post Modern architecture –Charles Jencks
3. K. Michael Hays, "Architecture Theory since 1968"
4. Kenneth Frampton, "Modern Architecture; A Critical History" by, Tames and Hudson
5. Colin Davies, "Thinking about Architecture and Introduction to Architectural Theory"
6. Robert Venturi, "Complexity and Contradiction in Architecture"
7. Le Corbusier, "Towards a New Architecture"
8. Charles Jencks, "The language of Post Modern Architecture".
9. Willam Jr.Curtis, "Modern Architecture since 1900", Phaidol
10. Aldo Rossi, " The Architecture of City"
11. Robert Venturi, " Learning from Las Vegas"
12. M. Reza Shirazi, "Towards an Articulated Phenomenological Interpretation of Architecture: Phenomenal Phenomenology".

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Sheets/Sketches of Module 1 - 3	2	5	10
2	Model of Module 1 - 3	2	5	10
3	Seminar	2	7.5	15
			TOTAL	35

B. ARCH. SEMESTER – VIII
RAR – 808, DISSERTATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	3	0	0	150	**150**	0	0	**0**	**150**	2	X	X

OBJECTIVES

- To research on a theoretical topic which may be relevant to the final thesis topic and do the necessary backgrounds work.
- Present the findings in report form

INTRODUCTION

Preparation of an Architectural Dissertation including reference to an extensive study of architectural examples and precedents in the selected field of study. This can be a related study for the final thesis next semester.

Each student is expected to submit one or more synopsis for finalization of his/her topic. After finalization of topic, by set of faculty members, the student shall be allotted one or more faculty member(s)/Guide(s)under whose guidance he/she has to carry out his/her dissertation.

Module-1	**Stage I** **Dissertation Plan** **Marks = 25**	Aims, Objectives, Hypothesis, Methodology, Scope & limitations. Brief literature review.
Module 2	**Stage II** **Mid-Term Review** **Marks = 50**	Detailed literature review, Case studies, Data collection & analysis. Revised dissertation plan.
Module-3	**Stage III** **Final Stage** **Marks = 50**	Final presentation of dissertation after incorporating suggestions of jury. Draft report.
Module-4	**Stage IV** **Final Report** **Marks = 25**	Submission of Final report (10 – 15 thousand words) after incorporating suggestions of jury. It shall be duly referenced in standard format.

COMPOSITION OF JURY PANEL FOR EVALUATIONOF DISSERTATION AT EVERY STAGE

- There shall be one or more jury panels. Each panel shall consist of the following -
- Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution.
- Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution.
- Thesis Guide(s).

There shall be three juries/presentations for each student in order to assess Stage I, Stage II and Stage III. The assessment of Stage IV, i.e. Final Report shallassessed by the same set of jury members as in Stage III.
Further the Dissertation Coordinator will act as facilitator.

REFERENCE BOOKS

1. Raman Meenakshi and Sharma Sangeeta, "Technical Communications – Principles and Practices", Oxford University Press, New Delhi.
2. Kate L.Tourabian, A manual for Writers of Research Papers, Theses and Dissertation, 8th edition.
3. Joseph Gibaldi, MLA handbook for Writers of Research Papers.

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 901, ARCHITECTURAL DESIGN - VIII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	8	30	70	**100**	75	25	**100**	**200**	7	6+6+6 HRS.	7 HRS.

OBJECTIVES

- This Design Studio attempts to foster an understanding required to handle large scale building projects like campuses and multi-utility building complexes.
- Understanding design as a function of specific agendas of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems.
- Integrating aspects of Sustainability in design and Site planning as essential components of the projects.
- Incorporating active methods for achieving sustainability like Water Harvesting, Waste management, Solar and Wind Energy beside others for achieving a smaller carbon footprint of the project.

Module-1	**Introduction**	Understand and learn how to solve the Built Environment needs for multi-faceted public activities especially foe large campuses. Recognizing and Integrating aspects of Sustainable design and planning.
Module-2	**Site Analysis & Case Study**	Examining existing case and literature studies of similar nature to develop design criteria. Extensive Site analysis of the proposed site for assessing on-site and off-site potentials and constraints.
Module-3	**Design Proposal**	Design of large campuses incorporating principles of efficient and sustainable site planning, space planning, circulation and services.
Module-4	**Integration of Advanced Services, Structure and Active Sustainable Strategies**	Besides design and planning of buildings within the campus the concentrations also needs to be on integration of complex building services, building sciences, building bye-laws in accordance to Master Plan of city and structural systems. Strategies of water harvesting, waste management, utilization of solar and wind energy and reducing the overall carbon footprint of the project.

SUGGESTED STUDIO EXCERCISES

1. Major design exercise could include large institutional campuses, convention centers, large office campuses having auditoriums and other multi-utility buildings.
2. Small exercises could include design of high-rise buildings like offices, hotels, hospitals etc. incorporating development of advanced structural and service systems.

APPROACH

- Students should develop programs after prototype studies
- Effective Site planning of the campus will be emphasised upon
- Integration of complex services and structure will be deliberated upon.

REFERENCE BOOKS

1. Architecture Today.
2. Concept to the manifest.
3. Projects of various Architects of similar nature.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Seminar / Presentation / Site Report of Module - 1	1	5	5
2	Seminar / Presentation Literature & Case Studies and Detailed Site Analysis of Module - 2	2	5	10
3	Design Exercises (Minor) of High Rise Building of Module – 3 & 4	2	10	20
3	Design Exercises (Major)of Large Sustainable Campus with Integration of Complex Servicesof Module - 3 & 4	1	35	35
			TOTAL	70

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER – IX
RAR – 902, CONSTRUCTION & MATERIALS - VIII

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	0	4	25	50	**75**	50	25	**75**	**150**	4	3 HRS.	3 HRS.

OBJECTIVES

- The understanding for the system to be adopted for the construction of large span & multi storey structures.
- To introduce and familiarize the students with the various roofing products for construction work.
- To introduce and familiarize the students with the various construction equipments required for speedy and effective construction works.
- To familiarize the student with the advanced building construction practices on site e.g. composite construction.

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SECTION – A, BUILDING MATERIALS AND SCIENCES

Module-1	**Forms of Steel for Industrial construction & Roofing products**	Classification, Availability, Characteristics and Usesof forms of steel and first to fourth generation steel roofing products.
Module-2	**Advanced Structural Concretes**	Structural Light weight Concrete, High Strength Concrete-Classification, Availability, Characteristics and Uses.
	Materials for Pre-Stressing	Classification, Availability, Characteristics and Uses.
Module-3	**Forms & Materials for Speedy Construction**	Reinforcement types, RMC. Advanced Formwork systems - Table Form / Flying Form, Column Formwork Systems, Horizontal Panel Systems, Vertical Panel Systems, Jump Form, Slip Form & Tunnel Form. Classification, Availability, Characteristics and Uses.

LIST OF ASSIGNMENTS (Market Surveys, Seminars & Report)

1. To study the availability, constituents, properties, manufacturing processes, storage, transportation and applications of above mentioned materials.
2. To visit P.V.C. factory etc. for better understanding and submit report.

WORKSHOP/CONSTRUCTION YARD PRACTICE & SITE EXPOSURE

Module-4	**Workshop/Construction Yard Practice**	Practicing in construction yard by making the examples of pre stressed components, industrial construction and speedy construction.
Module-5	**Site Exposure**	Exposure to advanced building construction practices on site of various items of work from foundation to roof and finishes.

LIST OF ASSIGNMENTS

1. To study the various tools, equipments used in Precast and Prestressed works.
2. To construct examples of precast and prestressed works in construction yard.
3. To survey construction work on site and submit report.

SECTION – B, BUILDING CONSTRUCTION TECHNOLOGY

Module-6	**Industrial Construction**	Structural Steel Works - Portal Frame Construction, North-light truss and Lattice girder roof with various roof coverings (corrugated metal sheets as roof panels- first to fourth generation sheets).
Module-7	**Pre-stressed Concrete**	Introduction, methods of pre-stressing, types of post-tensioning systems. Types of pre-stressed concrete structures- Beams (Short span, medium span, long span), Girders & Joists. Slabs (one way, two way, flat slabs, hollow core slabs, planks), Single & Double T slabs. Channel sections, Folded plate structures. Composite construction.

Module-8	**Prefabrication& Precasting**	Systems of pre fabrication – open prefab system, large panel prefab system, joints, pre-casting methods, materials, on-site and off-site prefabrication, components, etc. Precast RCC Frames - Beams and Column Frames, Wall Frames, Hollow core slabs, Planks and Tee slabs resting on Beam & Column frames and Wall frames. Connections between various components- beam to column, column to column, beam to slab, wall to slab.
Module-9	**Speedy Construction**	Methods, Types of floor construction – cast in situ, precast & composite construction. One-Way Slabs - Solid slabs, Slabs with wide beams, Ribbed slabs (One-Way Joists), One-Way joists with wide beams, Troughed slabs (ribbed slabs with integral beams and level soffits). Two-Way Slabs - Solid slabs, Waffle slabs designed as Two-Way slabs, Waffle slabs designed as Two-Way slabs with integral beams and level soffits, Flat slabs, Flat slabs with drops, Flat slabs with column heads, Waffle slabs designed as flat slabs Lift slab construction, Cast-in-situ service & stair cores, Cross wall & Box frame construction.
Module-10	**Modular Coordination**	Aims, basis, planning, dimensioning. Assembly of components, tolerances, positioning of functional elements – slabs, walls, staircases.

CONSTRUCTION PLATES

1. To understand large span structural steel works e.g. portal frames and truss-girder frames with various roof coverings products.
2. To understand the application of pre-stressed concrete in buildings – planks, hollow core slabs, single & double tee slabs, beams, columns and composite construction.
3. To understand the joint details in prefabricated buildings.
4. To understand one way and two way slab system in speedy construction.
5. To understand speedy construction techniques in buildings.
6. To understand the modular coordination in buildings' design and their components.

APPROACH

- The students would be familiarized with vernacular terminology as prevalent in this part of the country.
- The emphasis will be construction details as applicable to Indian conditions.
- Site visits and market surveys will be an integral part of sessional work.

REFERENCE BOOKS

1. McKay, W.B., "Building Construction Volume I, II, III and IV", Longmans, 1955.
2. Ching, Francis D. K. and Adams, Cassandra, "Building Construction Illustrated", Wiley and Sons, 2000.
3. The Construction of Buildings – Barry Volume I, II, III and IV
4. Chudley, Roy, "Construction Technology", Longman, 2005.
5. Building Construction_Mitchell (Elementary and Advanced)
6. Rangwala, S. C., "Building Construction", Charotar Publishing House, 2007
7. Building Construction-Bindra &Arora.
8. Punmia B. C., Jain A. J., and Jain A.J., Building Construction, Laxmi Publications, 2005.
9. Mitchell's Structure & Fabric-II
10. Prestressed Concrete Structures: P. Dayaratnam
11. Concrete: Microstructure, Properties and Materials P. Kumar Mehta
12. Properties of Concrete A. M. Neville
13. Concrete Admixture Handbook: Properties, Science & V. S. Ramchandran Technology
14. Modern Prestressed Concrete: J. R. Libby
15. Principle & Practices of Heavy Construction: Smith & Andres
16. Don A.Watson, Construction Materials and Processes, McGraw Hill Co.
17. Building Materials by SC Rangwala: Charotar Pub. House, Anand
18. M. Gambhir, NehaJamwal, Building Materials Products, Properties and Systems, Tata McGraw Hill Publishers, New Delhi, 2011.
19. R.K.Gupta, Civil Engineering Materials and Construction Practices, Jain brothers, New Delhi, 2009.
20. National Building Code of India (Latest Edition), Bureau of Indian Standards.

21. Engineering Materials-Deshpande.
22. Engineering Material-Roy Chowdary
23. Designing with models – Criss. B. Mills.
24. Morris, M., "Architecture and the Miniature: Models", John Wiley and Sons, 2000.
25. Mills, Criss B., "Designing with Models: A Studio Guide to Making and Using Architectural Models", Thomson and Wadsworth, 2000.
26. Raghuwanshi, B.S., "A Course in Workshop Technology - Vol. I and II", Dhanpat Rai and Co, 2001.
27. Wenninger (Magrus.J.) Spherical Models, Cambridge University Press, 1979
28. Testing of Concrete in Structures J H Bungey and S. G. Millard
29. Non-destructive testing V. M. Malhotra
30. Learning from failure – deficiencies in Design, Construction and Service R N Raikar
31. Concrete: Repair and Maintenance Illustrated, Problem Analysis, Repair strategy and Techniques Peter Emons & Gajanan Sabnis
32. Construction Failure Jacob Feld, Kennith Harper.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Construction Sheets/Plates of Module 6 – 10	6	4	24
2	Tutorial/Quiz/Sketches of Module 1 – 5	2	3	6
3	Market Survey & Seminar of Module 1 – 3	1	10	10
4	Workshop/Yard of Module 4	1	4	4
5	Site Visit Reports of Module 5	2	3	6
			TOTAL	50

B. ARCH. SEMESTER – IX
RAR – 903,PROFESSIONAL PRACTICE - I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To acquaint the students with the role of an architect in society; scale of charges; an architect's conduct in architectural Practice.
- To familiarize a student with requirements of Architectural Competitions and appointment of a contractor through tenders.
- To familiarize the students with Easement rights.
- Tofamiliarize studentswith Valuation of property.

Module-1	**Organisation of Profession**	Introduction to the professional Organisations e.g. the IndianInstitute of Architects, the Uttar Pradesh Architects Association. Their Objectives, working constitution, byelaws, categories of membership, election procedure etc. Detailed Study of the Architects' Act 1972, Council of Architecture and its role.
Module-2	**Professional Conduct, Conditions of Engagement**	Conditions of engagement ofanarchitect - Duties: Responsibilities and liabilities of anarchitect towards the profession and society,Scaleof Professional charges andmodeofpayment etc., Code of professional conduct and ethics, Need and typesofcompetitions,procedureforconducting competitions.
Module-3	**Tenders and Contracts**	Concept of Contract and essential elements of contract. Tenders, their need and types. Preparation of tender documents and procedure for awarding tenders and award of projects. Type of building contracts. Preparation of contract document - General conditions of contract, defect liability period, running & final payment, retention amount and virtual completion.
Module-4	**Office Organisation and Management**	Settingup practice- Business organization, Types of offices proprietorship, partnership, Private Limited etc., Salaried appointments - public sector, private sector. Basic understanding of Income tax and GST, Basic understanding of Office accounting procedures. Office Procedure ingovernment organization.
Module-5	**Valuation of Properties**	Fundamental concepts of Valuation, classification and typesof valuation, Elementsand factors affecting valuation; Valuation ofimmovable properties, Techniques for valuation of landedandbuilding property.
Module-6	**Arbitration**	Concept and need of Arbitration. Law governing arbitration in India – Salient features of the Indian Arbitration Act 1940 and provisions in subsequent amendments. Role of Arbitrator. Nature of arbitration. Appointment of arbitrator/s, Umpire, Conduct, Powers, and duties of arbitrators and umpires, Procedure of arbitration and preparation of awards etc.

APPROACH:

- The course will be covered through lectures citing practical examples.
- Specialist should supplement the course through extension lectures.

REFERENCE BOOKS

1. Dr. Roshan H. Namavati, Professional practice
2. Council of Architecture, handbook of professional document.
3. The Indian Institute of architects, the handbook of Professional Practice.
4. Madhav Devshaktu, Professional Practice.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module – 1-6	5	3	15
2	Seminar / Presentation of Module – 1 - 6	5	4	20
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 904, LANDSCAPE DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To make students aware of plant-scape around them
- To encourage hand drawing & drafting in landscape presentation drawings
- To familiarize students in preparation of simple landscape proposals.

Module 1	**Introduction to Landscape Architecture**	Role and scope of Landscape Architecture Factors affecting Landscape: Climatic / Natural conditions- (soil, water, landforms, vegetation, temperature, humidity, rainfall), Scale, Material, Cost, Time. Elements of Landscape Design: Natural elements (Landform, water, plantscape, microclimate) Design elements: (man-made water bodies, landscape furniture, lighting, hardscape and softscape) Principles of Landscape Design: Unity, Symmetry, Balance, Hierarchy, Repetition, Sequence with suitable examples
Module 2	**Landscape Graphics**	Techniques on making handmade landscape drawings: trees of varied textures, landforms, buildings, paving, foliage patterns, tone contrast, & balance, rock & water and other landscape features. Conventional symbols in landscape presentations.
Module 3	**Concise Theory and Evolution of Landscape Architecture**	Brief review of different garden styles.
Module 4	**Site Planning**	Detailed site analysis, identifying potentials and constraints, Site Mobilization, Sequence of site activity, Site protection measures, Site implementation, Contour Sites.
Module 5	**Landscape Engineering**	Landscape details including- Road and Parking, Paths and Plazzas. Wall, Steps, Ramps and Decks. Planters, Bed edges and Terraces. Pools and Water bodies. Terrace landscape and Vertical garden.
Module 6	**Planting Design**	Classification of Plants in accordance with composite climate: Trees, shrubs, groundcovers, flowering plants, creepers and climbers.
Module 7	**Landscape Design**	Landscape project: Inventory, Site analysis and Site planning, Conceptual design, Design development and Proposals and relevant constructional details.

APPROACH

1. Emphasis would be in drawing in studios
2. Site-visits to botanical gardens, existing parks & urban spaces
3. Suggested design exercises of traffic islands; small residences, campuses etc.

REFERENCE BOOKS

1. Geoffry& Susan Jellicoe: landscape of Man: shaping the environment from pre-history to the present day.
2. Brian Hackett: planting design
3. Nick Robinson: planting design handbook.
4. Ian Mcharg: Design with nature
5. Simonds: landscape architecture
6. Jay Applaton: Experience of Landscape
7. Paul Bannet: The language of Landscape
8. SimondSwaffield: Theory in Landscape Architecture
9. Trees of Delhi
10. Landscape Detailing (Vol. 1-4)- Michael Littlewood

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module – 1	1	5	5
2	Drawings / Sheets of Module – 2, 4&5	10	1.5	15
3	Seminar/Presentation of Module – 3&6	2	2.5	5
4	Design Exercises of Module - 7	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); A–BUILDING CONSTRUCTION MANAGEMENT

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To provide an insight into Management of Building/Construction projects involving management of money, manpower and machinery.
- To enhance the professional ability of an Architect about the methodology of executing a Project.
- To expose the students to the currently prevalent techniques in the planning, programming and management of a project.

Module 1	**Introduction**	Aim, objectives and functions of construction management. Role of Architect & Construction/Project Manager in Construction Management. Resources of construction Industry. Various stages of construction.
Module 2	**Organization**	Organization, types of organization study of organizational structures suitable for building and construction projects, the roles of the various members of a typical construction organization, responsibility & authority, functions in the management process, qualities of an ideal construction organization and ethics in construction industry.
Module 3	**Construction Management Techniques**	Construction Planning scheduling and controlling phases. Levels of details & time scale Resource scheduling, Smoothing & levelling, Project execution, Monitoring & progress reporting. Use of Management techniques – Bar charts and limitations of bar charts. Mile Stone Chart.
Module 4	**PERT and CPM**	Use of Management techniques –PERT and CPM; event, activity, dummy, network rules, graphical guidelines for network, numbering of events. CPM network analysis & PERT time estimates, time computation & network analysis. Cost time analysis in network planning using CPM.
Module 5	**Mechanization**	Advanced and automated technology in construction Introduction to construction equipment, performance, characteristics of equipment. The role of equipment /machinery in construction industry, factors affecting selection of construction machinery, standard versus special equipment, and understanding of the various issues involved in owning, operating and maintaining of construction equipment, economic life of equipment.
Module 6	**Resource Allocation & Quality Control**	Resource usage profile - Histogram, Resource smoothing and Resource levelling. Planning of temporary services at the site, Safety precautions at construction sites, Security of materials at building site, Stages of inspection and quality control. Computer applications in construction management. Introduction to IT in construction industry-software packages.

REFERENCES:

1. Construction Planning, Equipment and Methods by RL Peurifoy
2. Project Management for Architects by S P Mukopadhyay
3. Part and CPM by L S Srinath

4. Project management through network technologies M. Thyagarajah
5. Construction Project Management Planning, Scheduling & Controlling -K. Chitkara – Tata McGrawhill
6. Dr. B.C.Punmia et al. *Project planning and control with PERT and CPM*, Laxmi Publications, New Delhi
7. Jerome D.Wiest and Ferdinand K.Levy, A Management Guide to PERT, CPM, prentice Hall of India Pub,Ltd., New Delhi, 1982
8. R.A. Burgess and G.White, *Building production and project Management*, The construction press, London,1979
9. Sharma JC, Construction Management and Accounts, Satya Prakashan, New Delhi

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 6	6	4	24
2	Seminar/Presentation of Module 1 - 6	1	11	11
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); B–HOUSING

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To create awareness about the causes and consequences of housing problems and to impart knowledge about the possible solutions.
- Understanding of the various issues involved in urban and rural housing and knowledge about the planning and design solutions for low income groups

Module 1	**Introduction & Terminology**	Housing Need and Demand in India - Present and Future. House, Housing and Settlement. Detached and Attached House Types. Net & Gross Residential Density, Perceived Density, Zoning.
Module 2	**Settlement Patterns**	Introduction to human settlement, Settlement types and patterns, Relation of housing in present day context with relation to human settlement patterns.
Module 3	**Issues Affecting Housing**	Issues Affecting Housing - Climate Change, Social factors, Affordability, Health, Safety & Security, Noise Control, Utilities and Services.
Module 4	**Objectives of Housing Agencies**	Objectives and role of government, urban local bodies and other agencies in housing development: Census, NSSO, HUDCO, State Housing Board, NBO.
Module 5	**Housing Schemes**	Understanding of various housing schemes- Rajiv Awas Yojana (RAY), Pradhan Mantri Awas Yojna (PMAY), Site & Services Scheme, Rental Housing Policy, Slum Rehabilitation Policy.
Module 6	**Housing Development & Design**	Understanding of various Housing categories through case studies e.g., Condominiums, Co-operative Housing, Affordable Housing, Rural Housing, – Their Advantages and Disadvantages. Understanding of Neighbourhood. Exercises of moderate magnitude on Neighbourhood Planning.

REFERENCE BOOKS:

1. Babur Mumtaz and Patweikly, Urban Housing Strategies, Pitman Publishing, London, 1976.
2. Geofrey K.Payne, Low Income Housing in the Development World, John Wiley and Sons, Chichester, 1984.
3. John F.C.Turner, Housing by people, Marison Boyars, London, 1976.
4. Martin Evans, Housing, Climate and Ocmfort, Architectural Press, London, 1980.
5. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983. PatrikSchumacher : 2004, Digital Hadid.
6. Miglani O.P., Urban Housing in Developing Economy.
7. Jain A.K., Urban Housing and Slums.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1, 3, 4 &5**	**4**	**5**	**20**
2	**FieldStudies Reports / Presentation of Module 2 & 6**	**2**	**7.5**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); C–URBAN DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- The overall goal of the course is to help students formulate an understanding of the urban forms and spaces. City history and theory will be examined.
- The contemporary needs of the society and the role of spaces will be dealt along with the need for design control.

Module-1	**Introduction**	Emergence of urban design as a discipline, definitions and its ambiguities.
Module-2	**Urban Space Study**	Historical and contemporary example of urban space. Piazza del campo, St. Peters, Campidglio, St. Marco. Yerba Buena garden, San Francisco, Pike place market, Seattle Washington. Indian cases, particularly towns on bazars & streets.
Module-3	**Urban design Parameters**	Space and place, morphology, urban form and structure, fabric, texture, grain, enclosure, human scale, complexity, etc**.**
Module-4	**Basic Principles and Theories of Urban Design**	Theories related to visual or perception aspect (Gorden Cullen) Theories related to physical aspect (Kevin lynch) Theories related to social aspect (Jane Jacob) (after understanding above aspect student will explain above theory on Indian space and context)
Module-5	**Urban Design Details**	Urban outdoor lighting, urban green infrastructure, acoustic consideration for urban fabric, air quality at street level.

REFERENCE BOOKS

1. Whyte, William H. *The Social Life of Small Urban Spaces*. Washington D.C.: Conservation Foundation, 1980.
2. Alexander, C. (1987) *A New Theory of Urban Design*
3. Jane Jacobs, *The Death and Life of Great American Cities* (New York: Random House, 1961), *55*.
4. Jacobs, A. B. (1993). *Great streets*. Cambridge, MA: MIT Press.
5. Appleyard, D. (1981). *Livable streets*. Berkeley: University of California Press.
6. Lynch K, 1960 *The Image of the City* (Cambridge, Mass: MIT Press)
7. Lynch k, Good city form(Cambridge, Mass:MIT Press)
8. Goden Cullen, *the concise townscape.*
9. Rob krier, *urban space*
10. Bernard tshumi, *Manhattan transcript*
11. Deeependra Prasad, *New architecture and urbanism,*
12. John Lang, Architecture and Independence
13. Bill Hiller, *Social logic of space*
14. Paul D. Speriregon Architecture of town and cities, The MIT press
15. jan gehl , Life between buildings: using public space
16. ian geh,l Cities for people
17. Christopher Alexander, Public spaces public lifePattern language
18. *The City of Tomorrow and its Planning* by F. Etchells, London, Architectural Press, 1929,
19. Lewis mumford – city in history
20. Rapoport, amos history and precedent in environmental design
21. Rapoport, amos the meaning of built environment.
22. Watson D. et al (ed), Time saver standards of urban design, McGraw Hill,2003

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	5	25
2	Seminar/Presentation of Module 1 - 5	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); D–SUSTAINABLE ARCHITECTURE

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- Sustainable architecture aims to create environment – friendly and energy efficient building by actively harnessing renewable nature sources of energy (solar energy etc.) and utilizing materials that least pollute the environment
- The objectives include creating awareness of designing energy efficient building envelopes that respond to the climate of a place bldg. lighting of resource – efficient practices in India, advocating of the application of renewable energy system and the promotion of efficient lighting & HVAC system to reduce energy demand.
- Propose and evaluate strategies for improving the energy performance of buildings.

Module-1	**Introduction to Sustainability**	Sustainable development: Social, economic, environmental factors, ecological footprint, local and worldwide sustainable benchmarks. Energy consumption of buildings in the India; Need of energy efficient building in India.
Module-2	**Sustainable design Principals**	Principles and strategies - site design, energy management, renewable energy, Sustainable material selection, water management, indoor air quality, alternative Energy.
Module-3	**Solar Energy and Buildings**	Solar geometry and built form – Various techniques of shading to reduce heat gain in tropical climate. Various methods of Maximising exposure to solar radiation in cold & temperate climate. Heating & cooling loads – Energy conservation methods – Efficient daylighting.
Module-4	**Energy Codes and Rating System**	ECBC Code, LEED, IGBC, GRIHA, NBC, Internal load, ASHRAE 90.1 – compliance Paths.
Module-5	**Building Envelope**	Building envelope components- WALL, ROOF, FLOOR, DOOR, and WINDOW & SKYLIGHT. Role of envelope in building design for Energy efficiency.
Module-6	**Energy Simulation – eQuest- Energy Programming and Modelling**	Interface, basics of Schematic Design Wizard – building footprint, zoning, envelope construction, exterior doors and windows, Internal loads, Schedules, performing simulations - Design Development Wizard. Defining multiple shells. Importing/using CAD floor plans. Detailed edit mode.

REFERENCE BOOKS:

1. Climatically Responsive Energy Efficient Architecture, PLEA/SPA, New Delhi - 1995.
2. Ms.Sudha, N.K.Bansal and M.A.S.Malik - Solar Passive Building - Pergamon Press.
3. Brown, G Z, Sun, Wind and Light: Architectural design strategies, John Wiley, 1985.
4. Energy Simulation in Building Design, by J. Clarke Computerized Building Energy Simulation Handbook, by Waltz and Waltz
5. Green Building Guidelines: Meeting the Demand for Low-Energy, Resource Efficient

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 3	3	5	15
2	Seminar/Presentation& Report of Module 4	1	10	10
3	Simulation Design Development Report of Module 5 & 6	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); E–CONSERVATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVE:

- To understand what is heritage and its importance in terms of Architecture, structure, materiality and its significance in the evolution of the mankind in understanding nature and adapt and make its dwelling units respecting the nature and local climatic conditions.
- The overall goal is to conserve our rich heritage specially built heritage to showcase the richness of our Architecture, culture & society during various period of time and regime and promote conservation of our heritage for our future generations to see and learn evolution in building architecture and technologies during various time periods.
- Our main objective will be to document the heritage of our city and make guidelines, policies, conservation plans for built heritage structures, Heritage precincts and region with respect to its economic viability and spread awareness in the locals and institutions through workshops which will help in sustainable development of the societies.

Module-1	**Introduction to Architectural Conservation**	Definition of heritage, what is an historic building? Introduction to architectural conservation of buildings of importance – definition, nature, purpose and scope. Values in conservation; Ethics of conservation building conservation legislation etc.
Module-2	**Defects in Heritage**	Causes of defects and decay of a heritage structure. Natural agents of deterioration and loss.
Module-3	**Preparatory Procedures for Conservation.**	Preparatory procedures for conservation. Initial inspection, Continuing Documentation, Analysis of the documentation. Role or need of documentation for the conservation & restoration of the any Heritage built form, Heritage precincts or any sort of tangible and Intangible heritage. - Listing of the Region or Precincts for generating a data base of the heritage properties. - Development of regional level maps for various types of heritages. (Heritage site maps, Heritage land-use maps). - Buildings and Precincts typology study according to is usage, Architectural style, religion (study of demography and its comparison past and present) study. - Building material, Construction techniques of Heritage structures in various typologies of buildings with respect to time.
Module-4	**Introduction to International Charters**	Introduction to various charters their significance and their role in guiding our conservation policies and guidelines or regional level and structural level (special reference to Barra and Venice charter).
Module-5	**Literature Study and Site Visit**	Literature case study of Red Fort (available on ASI web site) and site visit of ASI protected heritage buildings (in local city/town) and along with condition assessment techniques and methods.

REFERENCE BOOKS:

1. An introduction to conservation by Feildon B. M.
2. Conservation of Building by I. H. Harvey.
3. A critical bibliography of Building Conservation by Smith I. H.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	5	25
2	Seminar/Presentation of Module 1 - 5	1	10	10
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 905, ELECTIVE - II (P.G. PREPARATORY); F-PRODUCT DESIGN

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To give students basic understanding about Product and Industrial design process.
- The emphasis of the course is on group product design projects.

Module-1 Introduction — Definition of product design, design by evolution & design by innovation, essential factors, morphology of design, primary design phases and flow charting

Module-2 Product Strategies & Analysis — Standardization, industrial design organisation, role of aesthetics in product design, functional design practice, strength, stiffeners and rigidity considerations in product design

Module-3 Review Of Production Processes — Primary, machining & non-traditional machining processes, manufacturing requirements in design of machine components, design for forging, pressed components, casting & machining, designing with plastics, rubber, ceramics & wood

Module-4 Economic Factor and Anthropometrics Effecting Design — Product value, design for safety, reliability and environmental considerations, economic analysis, human considerations in product design, anthropometry.

Module-5 Product Development — Product development from concept to product designing for function, production, handling, use and maintenance

APPROACH

- Basic knowledge has to be given by the teacher through presentation or any other technique supplemented by student seminars to make it interactive.
- Product development: Selection of the projects is based on the possibility of user interaction leading to innovation. Projects end with a comprehensive presentation through working/mock up models, design drawing and a report.

REFERENCE BOOKS

1. Chitale & Gupta, Product Design & Manufacturing, PHI, 3rd edition, ISBN-10: 8120326369, 2005.
2. Ulrich & Epinger, Product Design And Development; T M H, ISBN-10: 007229647X, 2005.
3. N. F. M. Roozenburg, J. Eekels, Product Design, Fundamentals and Methods, Willey Publications, 2008.
4. M. Baxter, Product Design - Practical Methods for the Systematic Development of New Products, Chapman & Hall, 1995.
5. P. H. Hill, The Science of Engineering Design, Holt, Rinehart and Winston, N.Y, 1970

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 4**	**2**	**5**	**10**
2	**Seminar/Presentation& Report of Module 2 - 4**	**1**	**10**	**10**
3	**Product Design & Development of Module 5**	**1**	**15**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER – IX
RAR – 906, ADVANCED SERVICES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To develop an understanding of the advanced building services and their application in the design proposals of buildings of slight complex nature such as multistoried.
- The thrust shall be on understanding the use and application of the services and not the calculation or numerical part.

CONTENTS

Module 1	**Gas Installation**	L.P.G / Bio-gas installations, their location and layouts in residential and non-residential buildings
Module 2	**Automated Parking System**	Introduction, Types, Working and Advantages of automated parking system.
Module 3	**Mechanical Ventilation**	Standard requirements of ventilation for different conditions of living and works. Conditions for comfort. Control of quality, quantity, temperature and humidity of air.
Module 4	**Control Room**	Code of Safety prescribed in NBC.
Module 5	**Waste Treatment & Management**	Introduction, Reduce–Reuse–Recycle, Waste collection, Treatment & disposal. Thermal treatment Dumps and Landfills. Biological waste treatment. Waste water treatment
Module 6	**Integrated Building Management System**	The objectives of the Integrated Building Management System (IBMS), the list of utility, safety and security systems that are generally monitored and controlled through IBMS, the various components of IBMS, types of integration with the utility, safety and security systems and the basic knowledge on how they are designed and installed.

SUGGESTED EXCERCISES

- Site visits of buildings where different types of advanced services equipments have been installed, their working and the merits and demerits of the system.
- In an already designed project of a large covered area & multi-stroried building installation of these systems and the location of their parts and how they will be connected.

APPROACH

- Specialized lectures from technical people in the field.
- Practical and site based exercises to make the data more comprehensive.

REFERENCES

1. Understanding Building Automation Systems (Direct Digital Control, Energy Management, Life Safety, Security, Access Control, Lighting, Building Management Programs) by Reinhold A. Carlson, Robert A. Di Giandomenico
2. Building Automation: Control Devices and Applications by In Partnership with NJATC (2008)
3. Building Control Systems, Applications Guide (CIBSE Guide) by The CIBSE (2000)
4. Building Automation Online by McGowan; McGowan, John J.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 6	6	3	18
2	Seminar/Presentation of Module 1 - 6	1	10	10
3	Site Visit Reports of Module 2 & 5	2	3.5	7
			TOTAL	35

B. ARCH. SEMESTER – IX
RAR – 907, ADVANCED SURVEYING & GEOMETIC TECHNIQUES

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	30	70	**100**	0	0	**0**	**100**	1	X	X

OBJECTIVES

- To develop knowledge and skills related to advanced surveying, photogrammetry, remote sensing and Geographic Information Systems (GIS) principles and practice.
- To impart knowledge about the basic principles of geomatics engineering techniques for data collection and mapping for planning infrastructural facilities, including various architectural applications.
- To provide basic knowledge of GIS, Remote Sensing, GPS theory and their applications using the existing state-of-the-art GIS software.

Module-1	**Total Station Survey**	Introduction, Working principle of total station and its use. Use of software for different applications.
Module-2	**Photogrammatery**	Definition, Principles and application of photogrammatery and stereoscopy in surveying.
Module-3	**GIS (Geographic Information System)**	Introduction togeographical concepts and terminology, Difference between Image Processing system and GIS, Utility of GIS. Raster and Vector Data - Introduction, Descriptions about Raster and Vector data, Raster Versus Vector, Raster to Vector conversion, Remote Sensing Data in GIS, Topology and Spatial Relationships, Data storage verification and editing. Data preprocessing, Geo-referencing, Interpolation of data, Database Construction, Data Output, GIS analysis functions, Generation of thematic maps, Digital Elevation Model (DEM), Introduction to software..
Module-4	**Remote Sensing**	Basics concepts of remote sensing, Electromagnetic spectrum, Platforms and sensors, Remote sensing data products, Introduction to visual and digital image interpretation techniques and image processing software, Field verification..
Module-5	**GPS (Global Positioning System)**	Introduction to GPS surveys, GPS data collection for mapping.
Module-6	**Application**	Application of geomatic engineering techniques to architecture and planning, Utility of high resolution remote sensing data for infrastructural planning, 3D visualization.

LIST OF ASSIGNMENTS (Practicals, Field Exercises & Drawings)

1. Preparing topographical map of given area using total station.
2. Study various aerial images.
3. Demo on various GIS software and their salient features.Practice on GIS for layers creation.
4. Customized application in GIS.
5. 3D GIS.
6. Use of remote sensing images for Landuse and landcover classification.
7. Use of GPS for taking field measurements.
8. Practice on Image Processing System to use remote sensing images.

REFERENCE BOOKS

1. Surveying Volume I & II by Dr. B.C. Punmia
2. Surveying and Leveling (Part – 1) by Kanetkar TP and Kulkarni SV
3. Surveying Volume -1 by Dr. K.R.Arora.
4. Burrough, P.A. and McDonnel, R.A., “Principles of Geographic Information System”, Oxford University Press.
5. Chrisman, Nicholas R., “Exploring Geographic Information Systems”, John Wiley.

6. Longley, Paul A, Goodchild, Michael F., Maguire, David J. and Rhind, David W., "Geographic Information Systems and Science", Wiley.
7. Lo, C.P. and Young, A.K.W., "Concepts and Techniques of Geographical Information System", Prentice Hall India.
8. Lillesand, T.L., and Kieffer, R. W., "Remote Sensing Image Interpretation", John Wiley and Sons.
9. Gopi, S., "Global Positioning System: Principles and Applications", Tata McGraw Hill.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Report on Working and Application of Module 1 & 2	2	5	10
2	Exercises of Module 3& 4	4	7.5	30
3	Exercises of Module 5 & 6	2	15	30
			TOTAL	70

B. ARCH. SEMESTER – IX
RAR – 908, ARCHITECTURAL THESIS - I

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	3	0	100	**100**	0	50	**50**	**150**	4	X	X

OBJECTIVES

- To prepare a student to conduct in-depth study of one focus area of thrust emerging from architectural domains like structure, climate responsiveness, vernacular, architecture theory/ philosophy, low cost construction techniques, parametric design and simulation, universal design, disaster management, green and intelligent buildings, advanced construction, services and materials etc. and form it as the basis of designing his/her thesis project proposal.
- To educate the student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
- To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.

INTRODUCTION

- The multiple challenges of 'built environment' offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a 'live' programme, as long as the topic can result in tangible 'built environment' solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic's relevance to serve the laid down specific objectives inherent in the philosophy of the institution.
- For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution.
- Thesis I in 9th semester shall comprise of the research part of thesis in form of report part while the 10th semester shall carry forward the design stages in form of drawings.
- The Thesis report shall also consist of thrust area studies/ research and all relevant contextual studies: of user, place and time to enable the formulation of design criteria and should be spiral bound for the thesis I submission.

Module-1	**Stage I** **Marks = 50**	**Selection and research of thrust area** Identification & brief Description of Literature/ library/ case studies to form background study. Thesis Plan: Identifying aims and objectives (for implementing thrust area in subsequent design proposals), methodology, scope and limitations.
Module-2	**Stage II** **Marks = 50**	Detailed Literature Review of selected Thrust Area/ Issue forming the Design Criteria for Thesis Project. All Literature and Library studies including prescribed standards for selected Thesis Project. Selection of Site(s) for implementation of Thesis Project. Selection of case Studies, along with criteria.

The Students will be expected to complete all Background Study for the Selected/ Proposed Thesis Project before leaving for winter break when he/she will conduct extensive site studies and visit case / prototype studies for submission of Stage I in next semester.

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION OF THESIS AT EVERY STAGE

- There shall be one or more jury panels. Each panel shall consist of the following -
- Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution/ university.
- Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution/ university.
- Thesis Guide(s).

There shall be **two** juries/presentations for each student in order to assess Stage I and Stage II.
Further the Thesis Coordinator (s) will act as facilitator.

COMPOSITION OF JURY PANEL FOR FINAL (EXTERNAL) EVALUATION / EXAMINATION OF THESIS.

- There shall be one or more jury panels. Each panel shall consist of the following -
- An Architect Director / Principal / Head of the Department / Professor of the parent institution / university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
- An eminent architect from the profession with at least 15 years of field experience.
- Thesis Guide(s) as member, but not part of evaluation.

Further the Thesis Coordinator (s) will act as facilitator.

B. ARCH. SEMESTER – X
RAR – 1001, ARCHITECTURAL THESIS - II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	26	0	450	**450**	0	350	**350**	**800**	20	X	X

OBJECTIVES

- To prepare a student to independently handle and present all aspects of an architectural design, from its evolution to final solution in totality.
- To understand the importance of the evolutionary stages of a design process and various techniques required for a successful presentation of an architectural design.
- To develop in students the ability to handle specific aspects / thrust area of design relevant to the topic.

INTRODUCTION

- The multiple challenges of 'built environment' offer unlimited scope for the choice of an architectural design thesis. The selection of the thesis subject may result either from issue/s involved, or from the challenges of design, or the inherent and acquired aptitude of a student, which he/she wishes to perfect and present. The variety of the intentions give students the choice to select the topic of the thesis from a purely hypothetical to a 'live' programme, as long as the topic can result in tangible 'built environment' solution. Consequently, the size of the project has no relevance in the selection of the topic; the riding clause being the topic's relevance to serve the laid down specific objectives inherent in the philosophy of the institution.
- For reasons of maintenance of uniformity in results and standards, the thesis presentation shall be in two distinct compartments: a report comprising of all the preliminary studies required for the thesis topic, and the final design solution.
- The Thesis report shall consist of all relevant contextual studies: of user, place and time to enable the formulation of design criteria.
- The design solution shall be in the form of drawings and models of the concept and design and shall further include the presentation of at least one specific aspect relevant to the selected topic in complete detail.
- The report, in duplicate, shall be submitted in bound form together with prints/photographs of all the drawings and model/s.
- All relevant/ pertinent drawings, sketches, models from previous stages to be put up for the jury to show evolution of design.

Module-1	**Stage III** **Marks = 100**	Summary of previous stages, Revised Design Criteria. Detailed Case Studies identified for Thesis Project. Detailed Site Studies and Analysis for implementation of Thesis Project. Concept and Sketch Design through drawings and models.
Module 2	**Stage IV** **Marks = 100**	Finalised Sketch Design through well drafted double line plans, sections, elevations and models.
Module-3	**Stage V** **Marks = 100**	Design development in form of Site Plan(s), floor Plan(s), Sections and Elevations, Views and Working Models fully explaining the design, Structural Systems, Services Compliance. Selection of Elective; Criteria, Objectives, Methods, Scope and Limitations.
Module-4	**Stage VI** **Marks = 75**	Developed working Drawings incorporating all structural systems, services and electives.
Module-5	**Final (Internal)** **Marks = 75**	Finalized Detailed Drawings complete with electives, 3Ds views, walk throughs and models with Final Thesis report

COMPOSITION OF JURY PANEL FOR INTERNAL EVALUATION OF THESIS AT EVERY STAGE

- There shall be one or more jury panels. Each panel shall consist of the following -
  - Senior faculty member, an architect, (Professor/Asso. Professor) of the Department of the parent institution / university.
  - Junior faculty member, an architect, (Asst. Professor) of the Department of the parent institution / university.

- Thesis Guide(s).

There shall be **five** juries/presentations for each student in order to assess Stage I to Stage V.
Further the Thesis Coordinator (s) will act as facilitator.

COMPOSITION OF JURY PANEL FOR FINAL (EXTERNAL) EVALUATION / EXAMINATION OF THESIS.

- There shall be one or more jury panels. Each panel shall consist of the following -
- An Architect Director / Principal / Head of the Department / Professor of the parent institution / university.
- An Architect Director / Principal / Head of the Department / Professor of other than the parent institution / university.
- An eminent architect from the profession with at least 15 years of field experience.
- Thesis Guide(s) as member, but not part of evaluation.

Further the Thesis Coordinator (s) will act as facilitator.

B. ARCH. SEMESTER – X
RAR – 1002, PROFESSIONAL PRACTICE – II

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
2	1	0	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To familiarize the students with elementary knowledge of various instruments of legislation to safeguard the professional interest of architects as also societal interest.

Module-1 Law related to Land

Introduction to the Land Acquisition Act - 1894 and its subsequent amendments through Act of 2013 and 2015, a study of the LAND ACQUISITION AMENDMENT BILL 2018. Notification to acquire land under various sections, concept of public purpose, and compensation apportionment etc.

The Uttar Pradesh Urban Buildings (Regulation of Letting, Rent and Eviction) Act, 1972- Its important provisions and effect on the urban development.

Module-2 Urban Development Law

Introduction to the UP Urban Planning and Development Act-1973- Concept of Urban Development Authority its power authority and Role in regulating the urban development, Salient features of the provisions of the act.

The Uttar Pradesh Slum Areas (Improvement and Clearance) (Amendment) Act- 1981 and its important provisions for achieving.

Module-3 Law of Easement

Concept of Easement and essential elements of valid easement, creation of easement – types of Easement, Easement by prescription, Easement by necessity and quasi easement. Termination, suspension and revival of easement and other related concepts.

Module-4 Mercantile Law

The Contract Act - 1872 and subsequent amendments – Concept of Agreement, Essential elements of Contract, Flaws in contract etc.

Indian Partnership Act - 1932 and subsequent amendments, Relationship of Partners, sharing of profits, Exit of a partner, liabilities of and rights of other partners.

Module-5 The Law of Environment

A general understanding of purpose, provisions, and the impact of various components of the environmental law e.g. The National Green Tribunal Act-2010; The Air (Prevention and Control of Pollution) Act- 1981; The Water (Prevention and Control of Pollution) Act- 1974; The Environment Protection Act, 1986; The Hazardous Waste Management Regulations, etc.

Module-6 Real Estate (Regulation and Development) Act, 2016 (RERA)

Concept of real estate, Need of the RERA and its impact on real estate, RERA authority, registration under the Act, Role and responsibilities and liabilities of architects under the provisions of the RERA.

APPROACH

- The spectrum of lectures will be covered through lectures citing practical examples. Specialist should supplement the courses through extension lectures**.**

REFERENCE BOOKS

1. Dr. Roshan H. Namavati, Professional practice
2. Council of Architecture, handbook of professional document.
3. The Indian Institute of architects, The handbook of Professional Practice.
4. Madhav Devshaktu, Professional Practice

5. Governance of Societies under Multistoried buildings/housing

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial/Quiz of Module 1–5	5	5	25
2	Seminar / Presentation of Module – 6	1	10	10
			TOTAL	35

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER –X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); A–ARCHITECTURAL PEDAGOGY

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- Seeking Responsive Forms of Pedagogy in Architectural Education.
- To develop students' critical thinking abilities about the role of community involvement in different phases of the design process.
- To enhance students' understanding of the core concepts, methods, and techniques that pertain to community design as they relate to different phases of the design process (programming, design, post occupancy evaluation), and as they relate to different types of environments.
- To understand the techniques of teaching a specialized course like architecture.
- The course would attempt encouraging students to evolve individual, creative yet pragmatic thought process.

Module-1	**Introduction To Architectural Pedagogy**	Understanding Pedagogy, Importance of Pedagogy, Role of Pedagogy in Architecture. Nature of Interaction between teacher and students, Level of participation / involvement of both Educators and Students in various subjects / experiences. The routines of students and educators. The rules that govern the relationship between students and teachers.
Module-2	**Instructional Methods and Techniques**	Instructional Methods - Lecture method, Demonstration method, Case Study method, Project method, Programmed Instruction/ Learning, Studio method. Instructional Media - Meaning, Need and importance, Projected media, Non-projected media, Computer Based multimedia.
Module-3	**Field Studies in Architecture**	Learning of various aspects of architecture through site visits. Understanding the methods of learning, observing and experiencing these aspects. Preparation of report of the particular case study.
Module-4	**Hands – on - Studios as a Tool for Learning**	Development of exercises for various subjects in Architectural Studios. Learning about programme making for the various studios and workshops.

REFERENCE BOOKS

1. Transformative Pedagogy in Architecture and Urbanism by Ashraf M. Salama.
2. Art, Architecture, Pedagogy Experiments in Learning by Ken Ehrlich.

REFERENCE WEBSITES

1. http://aap.cornell.edu/news-events/how-we-teach-architecture-pedagogy-featured-puerto-rico-symposium.
2. www.architectural-review.com/...pedagogies...architectural...
3. http://www.edtechpost.ca/readings/davidorr-architecture-as-pedagogy.pdf
4. www.field-journal.org/uploads/file/.../Field%205(1)%20Salama.pdf

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 2**	**2**	**5**	**10**
2	**Seminar/Presentation of Module 1 - 2**	**2**	**5**	**10**
3	**FieldStudies Reports of Module 3**	**1**	**5**	**5**
4	**Hands – on - Studios of Module 4**	**1**	**10**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER –X
NAR – 1003, ELECTIVE – III (MISCELLANEOUS); B–MANAGEMENT& MARKETING SKILLS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES:

- To impart the students latest and relevant knowledge from the field of management theory and practice.
- To provide opportunities to the students for developing necessary managerial skills.

Module-1 Basic Concepts of Management
Definition, Need and Scope, Introduction to Management Science, Theory & Practice, Environment of Management, Managers & Entrepreneurs, Managerial Roles & Skills, Manager's Social & Ethical Responsibilities.

Module-2 Functions of Management
Planning – Concept, Nature, Importance, Steps, Limitations, Management by objectives
Organizing - Concept, Nature, Importance, Principles, Centralization, Decentralization, Organization Structures, Line and Staff Authority, Functional, Leadership & Management, Product, Matrix, Geographical, Customer, New Forms of Organization – Virtual, Organizations as Networks - Types of Network. Organizations/Clusters – Self Organizing Systems. Organizational Designs
Staffing - Concept, Nature, Importance, Steps. Concept of knowledge worker.
Directing – Concept, Nature, Importance.
Controlling - Concept, Nature, Importance, Process of controlling, Control Techniques.

Module-3 Financial Management
Cost of project, Means of finance, Estimates of sales and production, Cost of production, Working capital requirement and its funding, Profitability projections, Break Even Point(BEP), Projected cash flow statement, Projected balance sheet, Project profitability at market prices, Techniques of financial appraisal, Financial risk and over-all financial viability of the project through Internal Rate of Return (IRR)

Module-4 Marketing Management and Skills
Introduction to Marketing concept - Evolution of marketing & customer orientation, Marketing Environment and Evaluation of Market opportunities, Market research & Marketing Information Systems, Demand forecasting, Market potential analysis, Product Life cycle, New Product development process.

Module-5 Marketing Environment and Planning
Promotion decisions, Integrated Marketing communications concept, Communication tools, Contents of Marketing Plan, Developing Marketing Plan for variety of goods and services, Promotion decisions, Integrated Marketing communications concept, Communication tools, Personal selling & Sales management

REFERENCE BOOKS

1. Essentials of Management – Koontz – TMGH
2. Essentials of Management- Thomson Southwestern, Andrew J. Dubrin
3. Principles & Practices of Management - Saxena
4. Modern management: concepts and skills- Samuel C. Certo and Tervis Certo,
5. Principles and Practices of Management - Shejwalkar and Ghanekar
6. Management Concepts & Practices – Hannagan
7. Managerial Economics – D. Salvatore, McGraw Hill, New Delhi.
8. Managerial Economics – Pearson and Lewis, Prentice Hall, New Delhi
9. Principles of Marketing - Philip Kotler and Gary Armstrong
10. Fundamentals of Marketing - Stanton
11. Marketing Management – Rajan Saxena

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 5	5	4	20
2	Seminar/Presentation of Module 1 - 5	5	3	15
			TOTAL	35

BACHELOR OF ARCHITECTURE (B.ARCH)

B. ARCH. SEMESTER –X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); C-FUTURISTIC ARCHITECTURE

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES:

- To have an overview of the innovative concepts for future in terms of design, infrastructure and latest technology.
- To understand the limitations in terms of energy and area to build and sustain.

Module-1	**Theoretical and Imaginative Ideas**	Overview of the theoretical texts and drawings of the ideas by architects over the ages, who have imagined beyond today. E.g. Scholari, Archigram (Peter Cook), Raimund Abraham, Boullee, Ledoux etc.
Module-2	**Alternate Sustainable Ideas through Design and Technology**	Enumerating the varied innovative energy alternatives and their harnessing through design ideas, materials, techniques and functions. Prefabrication as a basic module for building.
Module-3	**Social and Practical implications of a new world**	Comprehending the new social order, modes of transport, physical dimensions of an alternate world.
Module-4	**Futuristic Geometry**	Understanding a higher geometry (minimal surfaces) and its eventual spatial order. Fractals, Fuzzy Logic in architecture.

APPROACH:

- Presentations would be made by the teacher. The students are expected to do library studies and seminars on varied topics to supplement the information base and make it more interactive.

REFERENCE BOOKS:

1. Fantasy Architecture: 1500-2036 [Neil Bingham, Clare Carolin, Rob Wilson, Peter Cook]
2. Visions of the Future: Architecture for the 21st Century, Loft Publications.
3. Futuristic : Visions of Future Living, Caroline Klien (Editor), Stefanie Lieb (Text by)
4. Future Architectue by Eduard Broto

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 4**	**4**	**5**	**20**
2	**Seminar/Presentation of Module 1 - 4**	**1**	**15**	**15**
			TOTAL	**35**

B. ARCH. SEMESTER –X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); D–ARCHITECTURAL JOURNALISM

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To make students aware about Architectural Journalism
- To encourage them for Architectural writing, Documentation and Page Composition
- To familiarize students in preparation of Book Reviews and Articles.

Module-1	**Introduction To Architectural Journalism**	What is Journalism and why it is important? Relation between Architecture and Journalism. Looking at the ways design and the built environment are covered in the media today Reading a broad range of contemporary and historical writings by journalists and critics and discuss how these stories reveal different approaches, attitudes, and biases in covering design.
Module-2	**Introduction To Architectural Writing**	Writing on different kinds of articles - from news stories tocritical essays on particular buildings and social issues. Sometimes students will report on buildings under construction and other times they will reflect on and criticize projects that are completed. Learning how to gather information and do research for stories and then write various kinds of articles about built environment in Architecture, which will help them to understand the built environment and express their ideas on it.
Module-3	**The state of Architectural Criticism**	Introduction to Criticism and Importance of Criticism. Relationship between Architecture and Criticism. Reading the various articles from the magazines, newspapers and websites about the built environment to understand the criticism and social commentary. Failures of Architectural Criticism. Analysis of various critical themes, and their comparison and learn how to criticize a built environment in various aspects and writing about criticism.
Module-4	**Structure of Architectural Journals& Photo Journalism**	Learning of documenting the collected information. Formatting, page composition, editing write-ups, content writing. Learning the techniques of clicking photographs through specific angles of built environment and their editing and modification. Learning the technique of how the photographs are supporting the write-ups about built environment, to help them understand the expression of pictorial, verbal and visual relationship of architecture journalism.
Module-5	**The Built Environment &How We Live Today?**	Looking at and explaining a building in today's scenario. What's happening now and what should be the future. Read article and write an essay on recent projects. Writing about the new technologies in today's architecture and new construction techniques.

APPROACH

- Each week, students will have a reading and a writing assignment. Usually, readings will come from a newspaper, magazine, or website and students will have to respond with their own piece of writing. In class, everyone will discuss the readings and present their ideas about the topic in question.
- Students will be assessed by the quality of their writing, the level of understanding they bring to the readings and topics, and the quality oftheir in-class presentations and participation.

- Writing is a critical skill for all architects, one that they can use to communicate with clients, the public, and other Architects.

REFERENCE BOOKS

1. Dave Sounders, *Professional Advertising Photography*, Merchurst, London 1988
2. Roger Hicks, *Practical photography*, Cassell, London 1996
3. Julian Calder and john Garrett, *The 35mm Photographer's* Handbook, Pan Books, London 1999
4. Julie Adair King, *Digital Photography for Dummies*, COMDEX, New Delhi 1998
5. Architecture and the Journalism of Ideas by Bender, Thomas
6. Architectural Criticism and Journalism by Mohammad al-Asad w/ Majd Musa
7. Nieman Reports: *Architectural Criticism: Dead or Alive* by Blair Kamin.
8. *The Failures of Architecture Criticism,* by Lance Hosey in theHuffington Post.
9. *Writing Architecture: A Practical Guide to Clear Communication about the Built Environment,* byCarter Wiseman

REFERENCE WEBSITES

1. http://niemanreports.org/articles/ar chitecture-criticism-dead-or-alive/
2. http://www.huffingtonpost.com/lanc e-hosey /the-failures-of architect_b_6445858.html
3. Architectural website, such as **archrecord.com**; **archpaper.com**; **archdaily.com**; and **dezeen.com**
4. Grace Farms designed by SANAA, article in Architectural Record by
5. Naomi R. Pollock. http://archrecord.construction.com/ projects/portfolio/2015/1511- Grace-Farms Kazuyo-Sejima- Ryue-Nishizawa-SANAA.asp
6. http://archrecord.construction.com/ tech/techFeatures/2015/1509- Mass-Timber-Construction.asp

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 5**	5	4	20
2	**Seminar/Presentation of Module 1 - 5**	1	15	15
			TOTAL	35

B. ARCH. SEMESTER –X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); E–ART APPRECIATION

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE						
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			F.O.A.	A.K.T.U.
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- The knowledge and understanding of the universal and timeless qualities that identify all great art.
- To introduce the students to the importance of art in today's world and the purposes art has served from pre - historic through modern times in a variety of cultures both western and oriental.
- To understand artistic intent and expression through basic element of art and architecture and to increase appreciation of art in today's society.

Module-1	**Introduction & Terminology**	Grammar of the language of art - Natural, Realistic, Symbolic, Abstract, Modern and Contemporary.
Module-2	**Ideologies of Aesthetics in Art**	Complete understanding of Ideologies of aesthetics in art while discussing the art of Western and Oriental. Plato, Aristotle, Baumgartan, I.A. Richards, Leo Tolstoy, Sigmund Freud. Shadanga: Six limbs of Indian painting. Rasa theory of 'Bharat Muni'. Iconography.
Module-3	**Development of Art**	Development of art over the period of time. Tracking the progress in art in aspects of theFunctional diversity of styles, Art as form of social consciousness, Impact of Cultural and Religion on art, Understanding the role of art in contemporary society.

APPROACH

- Presentation would be made by the teacher. The students are expected to do library studies and seminars (Reports, Tutorials and PPT's) on varied topics to supplement the information base and make more interactive.

REFERENCE BOOKS

1. What Is Art For? (June 1, 1990) by Ellen Dissanayake.
2. Learning to Look: A Handbook for the Visual Arts (Phoenix Books) 2nd Revised ed. Editionby Joshua C. Taylor.
3. More Than Meets The Eye: Seeing Art With All Five Senses (Bob Raczka's Art Adventures) Paperback – October 1, 2003by Bob Raczka.
4. How to Read a Painting: Lessons from the Old Masters Paperback – December 7, 2004by Patrick De Rynck.
5. Learning to Look at Modern Art by Mary Acton.
6. Teaching with Khan Academy: Art for Beginners: A Curriculum Guide to Teaching Beginning Art History and Appreciation with Khan Academy Paperback – Large Print, November 8, 2012by Beverly Fields.
7. Art: Over 2,500 Works from Cave to Contemporary Hardcover – October 20, 2008by Iain Zaczekand Mary Acton.
8. Aesthetics- YURI BOREV.
9. Approaches to Art in Education- LAURA H. CHAPMAN.
10. Panorama of the Arts- RUDEL.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	**Tutorial of Module 1 - 3**	**3**	**5**	**15**
2	**Seminar/Presentation of Module 1 - 3**	**1**	**10**	**10**

3	Hands – on – Studios of Module 3	1	10	10
			TOTAL	35

B. ARCH. SEMESTER –X
RAR – 1003, ELECTIVE – III (MISCELLANEOUS); F–HUMAN SETTLEMENTS

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER	
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					F.O.A.	A.K.T.U.
			CT	TA	TOTAL	THEORY	VIVA	TOTAL				
1	0	2	15	35	**50**	50	0	**50**	**100**	2	3 HRS.	3 HRS.

OBJECTIVES

- To study the Evolution and Growth of Human Settlements
- To expose students to the development of Human Settlements in the Indian Context
- To Critically analyse learnings from development of informal and formal Human Settlements
- To discuss new and emerging concepts, methods and tools to face new challenges in built environment in Developing countries.

Module-1	**Evolution and Development of Human Settlements**	Origin and Growth of Human Settlements, River Banks as carriers to growth of Human Settlements; River valley Settlements: Greek, Roman, Medieval, Renaissance and Modern.
Module-2	**Human Settlements in India**	Human Settlements in India since the ancient to Medieval and Modern periods. Factor affecting their development and extinction: Scio-Cultural, Disasters and Environmental Aspects.
Module-3	**Study and Analysis of Informal and Formal Settlements**	Detailed Analysis of selected informal and formal human settlements in the world and India for deriving learnings for contemporary usage especially in the context of Efficient management of Resources, Solid Waste Management, Sustainability, Preservation of Cultural Practices.
Module-4	**Establish criteria for contemporary Sustainable human settlements**	A critical evaluation and discussion of new emerging concepts methods and tools, and cases like Masdar City, Auroville for upcoming challenges in human settlements for developing countries.

APPROACH

- Focus shall be on learning from growth and development of traditional human settlements.
- Aspects affecting their evolution and socio-cultural and other related aspects.
- Learning through case studies and literature studies along with relevant site visits shall be preferable.

REFERENCE BOOKS

1. Water Conservation Techniques in Traditional Human Settlements by Pietro Laureano.
2. Human Settlements: The Environmental Challenge. A compendium of United Nations papers prepared for the Stockholm conference on Human Environment 1972.
3. The Evolution of Human Settlements from Pleistocene Origins to Anthropocene Prospects by Bowen, William M., **Gleeson**, Robert E.
4. History of human settlements and urban design from the early ages to the end of the 19th century (Council of Planning Librarians. Exchange bibliography) Unknown Binding – 1969 by Gideon Golany
5. Evolution of human settlements in India by S.P. Chatterjee
6. Human Settlements and Planning for Ecological Sustainability: The Case of Mexico City by Keith Pezzoli John Friedmann.

CRITERIA FOR ASSESSMENT OF SESSIONALS

S.NO.	PARTICULARS	NO. OF ASSIGNMENTS	MARKS PER ASSIGNMENT	TOTAL
1	Tutorial of Module 1 - 2	2	5	10
2	Case / Site Study of Module 3	3	5	15

3	**Seminar/Presentation of Module - 4**	**2**	**5**	**10**
			TOTAL	**35**

B. ARCH. SEMESTER – IX
NAR – 903, ELECTIVE - II(F – ENERGY SIMULATION)

PERIODS			EVALUATION SCHEME						SUBJECT TOTAL	CREDITS	DURATION OF THEORY PAPER
LECTURE	TUTORIAL	PRACTICAL/ STUDIO	SESSIONAL ASSESMENT			ESE					
			CT	TA	TOTAL	THEORY	VIVA	TOTAL			
1	2	0	15	35	**50**	50	0	**50**	**100**	3	3 HRS.

OBJECTIVES
Students should able to –

5. Apply energy and mass conservation principles in the analysis of energy performance of buildings;
- Conduct design day and annual analysis of energy use in residential and commercial buildings;
- Develop detailed building energy simulations using state-of-theart building energy simulation software packages;
- Propose and evaluate strategies for improving the energy performance of buildings. architects whose works have been influenced by the vernacular architecture of the region.

Module-1	**Introduction**	Overview: Energy consumption of buildings in the India; Need of energy efficient building in India
Module-2	**Energy Simulation softwares**	Software programs for energy simulation modeling (Ecotect, Energy Plus, Open Studio & Sketch Up, eQuest, Trnsys, IES/VE, DOE, TRACE).
Module-3	**Energy Codes and Standards**	ECBC Code, LEED, IGBC, GRIHA, BEE. ASHRAE 90.1 – compliance paths
Module-4	**Internal loads in buildings**	Plug loads, lighting, people, equipment. Schedules. Data resources for building sector energy use. Energy Use Intensity (EUI)
Module-5	**eQuest- Energy programming and modelling**	eQuest's interface, basics of Schematic Design Wizard – building footprint, shape, zoning, envelope construction, exterior doors and windows, performing simulations, and basic output. Design Development Wizard. Defining multiple shells. Importing/using CAD floor plans. Detailed edit mode.

REFERENCE BOOKS

- Energy Simulation in Building Design, by J. Clarke Computerized Building Energy Simulation Handbook, by Waltz and Waltz
- Green Building Guidelines: Meeting the Demand for Low-Energy, Resource Efficient
- Contrasting capabilities of building energy performance simulation programs. Research Paper by Drury B. Crawley