ಶರಣಬಸವ Sharnbasva ವಿಶ್ವವಿದ್ಯಾಲಯ University

SCHEME OF TEACHING AND EXAMINATION
I SEM B. ARCH (2024 SERIES)

Sl.no	Course code	Course Category	Title of Course	Teaching Scheme in Periods per Week					Examination Scheme							
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	Theory	Practical	CIE MARKS	VIVA	TERM WORK	TOTAL	CREDITS
					core	applied										
1	24ARC11	PC	Architectural Design-I	1	3	2	1	7	-	-	-	100	100		200	7
2	24ARC12	BS & AE	Building construction and Materials - I	2	2	0	0	4	-	-	-	50	50		100	4
3	24ARC13	PC	Architectural Graphics-I	1	0	3	0	4	-	-	-	50	-	50	100	4
4	24ARC14	PC	History of Architecture-I	3	0	0	0	3	3	50	-	50	-	-	100	3
5	24ENG15	BS & AE	Structures-I	3	0	0	0	3	3	50	-	50	-	-	100	3
6	24ART16	PC	Basic Design and Visual Arts	1	1	0	2	4	-	-	-	50	-	50	100	4
7	24ART17	PC	Model Making Workshop	1	1	0	0	2	-	-	-	50	-	-	50	2
8	24ARC18	SEC	Communication Skills	2	0	0	0	2	3	50	-	50	-	-	100	2
9	24SFH19	AEC	Scientific Foundation of Health.	1	0	0	0	1	2	50		50			100	1
TOTAL				15	7	5	3	30	11	200	-	500	150	100	950	30

ARC=Architectural Subjects ART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=09 No. of Theory Examinations =04

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% I Cneach

Subject Categories': Professional BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses HSMC-Humanity Science and Management course
PAEC: Professional Ability EnhancementCourses SEC: Skill Enhancement Courses OE: Open ElectiveCourses (PC): Project Core
(PC): Project Core

BOS CHAIRPERSON



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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
II SEM B. ARCH (2024 SERIES)

Sl.no	Course code	Course Category	Title of Course	Teaching Scheme in Periods per Week					Examination Scheme							
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	Theory	Practical	CIE MARKS	VIVA	TERM WORK	TOTAL	CREDITS
					core	applied										
1	24ARC21	PC	Architectural Design-II	1	3	3	0	7	-	-	-	100	100		200	7
2	24ARC22	BS & AE	Building construction and Materials - II	2	2	0	0	4	-	-	-	50	50		100	4
3	24ARC23	PC	Architectural Graphics-II	1	2	1	0	4	-	-	-	50	-	50	100	4
4	24ARC24	PC	History of Architecture-II	3	0	0	0	3	3	50	-	50	-	-	100	3
5	24ENG25	BS & AE	Structures-II	3	0	0	0	3	3	50	-	50	-	-	100	3
6	24ENG26	PC	Surveying and leveling	2	0	0	1	3	3	50	-	50	-	-	100	3
7	24ARC27	SEC	Computer Application in Architecture-I	1	0	0	2	3	-		50	50			100	3
8	24ART28	ART	Art Appreciation	1	0	1	0	2	-	-	-	50	-	-	50	2
9	24HUM29	HUM	Social Connect and Responsibility	1	0	0	0	1	2	50	-	50			100	1
			TOTAL	15	7	5	3	30	11	200	50	500	150	50	950	30

ARC=Architectural Subjects ART=Art Subjects sENG =Engineering SucbjetsHUM = Humanities Subjects.

No. of Subjects/Heads=09 No. of Theory Examinations =04

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses HSMC-Humanity Science and Management course
PAEC: Professional Ability EnhancementCourses SEC: Skill Enhancement Courses OE: Open ElectiveCourses (PC): Project Core
(PC): Project Core

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SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
I SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC11	PC	Architectural Design-I	1	3	2	2	8	-	50	50	100	8
2	21ARC12	BS & AE	Materials and Methods in Building construction - I	2	2	1	0	5	4	50	50	100	5
3	21ARC13	PC	Architectural Graphics-I	1	0	3	0	4	4	50	50	100	4
4	21ARC14	PC	History of Architecture-I	3	0	0	0	3	3	50	50	100	3
5	21ENG15	BS & AE	Building Structures-I	3	0	0	0	3	3	50	50	100	3
6	21ART16	PC	Basic Design and Visual Arts	0	1	1	1	3	-	50	50	100	3
7	21ART17	PC	Model Making Workshop	0	0	0	2	2	-	50	50	100	2
TOTAL				10	6	7	5	28	-	350	350	700	28

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=07 **No. of Theory Examinations =04**

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': PC:Professional Core BS&AE: Building Sciences & AppliedEngineeringCourses PE: Professional Elective Courses
PAEC: Professional Ability EnhancementCourses SEC: SkillEnhancementCourses OE: Open ElectiveCourses
(PC): Project Core

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SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
II SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC21	PC	Architectural Design-II	1	2	2	1	6	-	50	50	100	6
2	21ARC22	BS & AE	Building construction and Materials - II	2	1	1	0	4	4	50	50	100	4
3	21ARC23	PC	Graphics-II	1	1	1	0	3	4	50	50	100	3
4	21ARC24	PC	History of Architecture-II	3	0	0	0	3	3	50	50	100	3
5	21ENG25	BS & AE	Structures-II	3	0	0	0	3	3	50	50	100	3
6	21ENG26	PC	Surveying and leveling	3	0	0	0	3	3	50	50	100	3
7	21ARC27	BS & AE	Visual Arts	0	1	1	0	2	-	50	50	100	2
8	21ARC28	SEC	Communication Skills	2	0	0	0	2	-	50	50	100	2
			TOTAL	**15**	**4**	**4**	**1**	**26**	-	**400**	**400**	**800**	**26**

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=08 **No. of Theory Examinations =05**

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': PC:Professional Core BS&AE: Building Sciences & AppliedEngineeringCourses PE: Professional Elective Courses
PAEC: Professional Ability EnhancementCourses SEC: SkillEnhancementCourses OE: Open ElectiveCourses
(PC): Project Core


Poojya Dr. Sharnbaswappa Appaji
Mahadasohi Peethadhipathi
Sharnbasveshwar Samsthaana
President,Sharnbasveshwar Vidya Vardhak Sangha
Chancellor, Sharnbasva University


Poojya Matoshri Dr. Dakshayini S. Appa
Chairperson,
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Poojya Chiranjeevi Doddappa Appa
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University


Poojya Matoshri Godutai Avvaji


Poojya Doddappa Appa
Founder President
Sharnbasveshwar Vidya Vardhak Sangh

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SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
III SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC31	PC	Architectural Design-III	1	3	2	2	8	-	50	50	100	8
2	21ARC32	BS & AE	Building construction and Materials - III	1	2	1	0	4	4	50	50	100	4
3	21ARC33	PC	Graphics-III	1	2	1	0	4	-	50	50	100	4
4	21ARC34	PC	History of Architecture-III	3	0	0	0	3	3	50	50	100	3
5	21ENG35	BS & AE	Structures-III	3	0	0	0	3	3	50	50	100	3
6	21ARC36	BS & AE	Building Services-I	3	0	0	0	3	3	50	50	100	3
7	21ARC37	SEC	Computer Application in Architecture-I	1	0	0	1	2	-	50	50	100	2
8	21ARC38	PC	MEASURING Drawing and Documentation	0	0	1	0	1	-	50	50	100	1
TOTAL				12	7	5	3	28	-	400	400	800	**28**

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=08 No. of Theory Examinations =04

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': PC:Professional Core BS&AE: Building Sciences & AppliedEngineeringCourses PE: Professional Elective Courses
PAEC: Professional Ability EnhancementCourses SEC: SkillEnhancementCourses OE: Open ElectiveCourses
(PC): Project Core

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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
IV SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC41	PC	Architectural Design-IV	1	3	2	2	8	-	50	50	100	8
2	21ARC42	BS & AE	Building construction and Materials - IV	2	1	1	0	4	4	50	50	100	4
3	21ARC43	BS & AE	Climatology	1	1	1	0	3	3	50	50	100	3
4	21ARC44	PC	History of Architecture-IV	3	0	0	0	3	3	50	50	100	3
5	21ENG45	BS & AE	Structures-IV	3	0	0	0	3	3	50	50	100	3
6	21ARC46	BS & AE	Building Services-II	3	0	0	0	3	3	50	50	100	3
7	21ARC47	SEC	Computer Application in Architecture-II	1	0	0	1	2	-	50	50	100	2
8	21ARC48	PC	Working Drawing-I	1	0	2	0	3	-	50	50	100	3
TOTAL				14	5	6	3	29	-	400	400	800	29

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=08 No. of Theory Examinations =05

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': PC:Professional Core BS&AE: Building Sciences & AppliedEngineeringCourses PE: Professional Elective Courses
PAEC: Professional Ability EnhancementCourses SEC: SkillEnhancementCourses OE: Open ElectiveCourses
(PC): Project Core

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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
V SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC51	PC	Architectural Design-V	1	3	2	0	6	-	50	50	100	6
2	21ARC52	BS & AE	Building construction and Materials - V	1	2	1	0	4	4	50	50	100	4
3	21ARC53	HUM	Building Economics and Sociology	2	0	0	0	2	3	50	50	100	2
4	21ARC54	PC	Theory of Architecture-I	1	1	0	0	2	3	50	50	100	2
5	21ENG55	BS & AE	Structures-V	3	0	0	0	3	3	50	50	100	3
6	21ARC56	PC	Building Services-III	3	0	0	0	3	3	50	50	100	3
7	21ARC57	SEC	Computer Application in Architecture-III	1	0	0	1	2	-	50	50	100	2
8	21ARC58	BS & AE	WORKING DRAWING -II	1	0	0	1	2	-	50	50	100	2
9	21ARC5XX	PC	Elective A	2	0	0	1	3	-	50	50	100	3
TOTAL				12	6	3	3	27	-	450	400	900	27

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=09 No. of Theory Examinations =05

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses
PAEC: Professional Ability EnhancementCourses SEC: Skill Enhancement Courses OE: Open ElectiveCourses (PC): Project Core

ELECTIVE-A
1.Climate Responsive Design -21ARC591
2.Vernacular Architecture-21ARC592

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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
VI SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/ Seminar	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC61	PC	Architectural Design-VI	1	3	2	0	6	-	50	50	100	6
2	21ARC62	BS & AE	Building construction - VI	1	2	1	0	4	-	50	50	100	4
3	21ARC63	PC	Physical Planning-I	1	1	1	0	3	3	50	50	100	3
4	21ARC64	PC	Theory of Architecture-II	1	1	0	0	2	3	50	50	100	2
5	21ENG65	BS & AE	Structures-VI	3	0	0	0	3	3	50	50	100	3
6	21ARC66	PC	Professional Practice-I	3	0	0	0	3	3	50	50	100	3
7	21ARC67	PC	Building Acoustics	3	0	0	0	3	3	50	50	100	3
8	21ARC6xx	BS & AE	Elective-B	2	0	1	0	3	3	50	50	100	3
TOTAL				15	7	5	0	27	-	400	400	800	27

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=08 No. of Theory Examinations =06

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses
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ELECTIVE-B
1.Housing -21ARC681
2.Architectural Conservation-21ARC682

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VII SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC71	PC	Architectural Design-VII	1	5	3	0	9	-	50	50	100	9
2	21ARC72	BS & AE	Building construction - VII	1	1	2	0	4	-	50	50	100	4
3	21ARC73	PC	Physical Planning-II	1	2	0	0	3	-	50	50	100	3
4	21ARC74	PC	Urban design	1	0	2	0	3	3	50	50	100	3
5	21ENG75	BS & AE	Structures-VII	3	0	0	0	3	-	50	50	100	3
6	21ARC76	PC	Professional Practice-II	3	0	0	0	3	3	50	50	100	3
7	21ARC77	PC	Estimation and Costing	2	0	1	0	3	3	50	50	100	3
8	21ARC7XX	EC	Elective-C	2	0	0	0	2	-	50	50	100	2
TOTAL				14	8	8	0	30	-	400	400	800	30

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=08 No. of Theory Examinations =04

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses

PAEC: Professional Ability EnhancementCourses SEC: Skill Enhancement Courses OE: Open ElectiveCourses (PC): Project Core

ELECTIVE-C
1.Interior Design -21ARC781
2.Earthquake Resistance Building Design -21ARC782

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Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
					core	applied							
1	21ARC81	PC	Architectural Design-VIII	1	5	3	0	9	-	50	50	100	9
2	21ARC82	PC	Advanced Building Construction and Materials	2	4	-	0	6	-	50	50	100	6
3	21ARC83	BS & AE	Pre Architectural Design Project.	1	0	2	0	3	-	50	50	100	3
4	21ARC84	PC	Construction Project Management	3	0	0	0	3	3	50	50	100	3
5	21ARC85	PC	Landscape Design	1	2	0	0	3	**3**	50	50	100	3
6	21CIPE86	HUM	Constitutional Law	1	0	0	0	1	2	50	50	100	1
7	21ARC8XX	BS & AE	Elective-D	1	0	1	0	2	-	50	50	100	2
TOTAL				10	11	6	0	**27**	-	350	350	700	**27**

ARC=Architectural SubjectsART=Art Subject sENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=07 No. of Theory Examinations =03

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional Course BS&AE: Building Sciences & Applied Engineering Courses PE: Professional Elective Courses

PAEC: Professional Ability EnhancementCourses SEC: Skill Enhancement Courses OE: Open ElectiveCourses (PC): Project Core

ELECTIVE-D
1. Energy Efficient Building Design-21ARC871
2.Furniture Design-21ARC872

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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
IX SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Duration					Examination Scheme				
									Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	CREDITS
1	21ARC91	PAEC	Professional Training	16 weeks 100 days					-	50	50	100	26
TOTAL				0	0	0	0	0	-	50	50	100	**26**

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=01 **No. of Theory Examinations =00**

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: ProgressiveMarks50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories': Professional **BS&AE: Building Sciences & Applied Engineering Courses** **PE: Professional Elective Courses**
PAEC: Professional Ability Enhancement Courses **SEC: Skill Enhancement Courses** **OE: Open ElectiveCourses** **(PC): Project Core**

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FACULTY OF ARCHITECTURE

SHARNBASVA UNIVERSITY, KALABURAGI
SCHEME OF TEACHING AND EXAMINATION
X SEM B. ARCH (2021 SERIES)

Sl.no	Subject code	Subject Category	Title of Subject	Teaching Scheme in Periods per Week					Examination Scheme				
				Lecture	Studio		Prac/Tutorial/	Total	Dur (hrs)	CIE MARKS	SEE MARKS	TOTAL	1
					core	applied							
1	21ARC101	PC	Architectural Design Project (Thesis)	0	10	8	0	18	-	50	50	100	18
2	21ARC102	PC	Sustainable Architecture	1	0	2	0	3	3	50	50	100	3
4	21ARC103	PC	Seminar	2	0	2	0	6	-	50	50	100	6
TOTAL				3	10	12	0	27	-	150	150	300	**27**

ARC=Architectural SubjectsART=Art SubjectsENG =Engineering SubjectsHUM = Humanities Subjects.

No. of Subjects/Heads=03 **No. of Theory Examinations =01**

Progressive Marks to be awarded by the subject teacher. Term work & Viva Voce examination shall be conducted jointly by one internal & one external examiner appointed by the University

Minimum Marks for passing: Progressive Marks 50%,Theory marks, Term work marks and Viva marks 50% ineach

Subject Categories':PC: Professional **BS&AE: Building Sciences & Applied Engineering Courses** **PE: Professional Elective Courses**
PAEC: Professional Ability EnhancementCourses **SEC: Skill Enhancement Courses** **OE: Open ElectiveCourses** **(PC): Project Core**

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SYLLABUS OF ALL **SEMESTERS ARCHITECTURE**

Department Faculty of Architecture

(With effect from 2021:22)

SHARNBASVA UNIVERSITY

Kalaburagi www.sharnbasvaunuversity.edu.in

The Sharnbasveshwar Vidya Vardhak Sangha

The Sharnbasveshwar Vidya Vardhak Sangha was founded in 1901 by the 6th peethadhipati, made a humble, yet a noble beginning with its first school housed in Mahadasoha : Mahamane the spiritual abode. Then onwards it has never looked back and has grown into leaps and bounds. Dedicating itself to the pursuit of service and excellence has grown into a mammoth educational centre imparting science, commerce, management , arts, engineering & technical education to nearly 20,000 students from LKG to PG in 40 institutions spending nearly 100 crores in 100 years of its meaningful and eventful existence

SHARNBASVA UNIVERSITY

FACULTY OF ARCHITECTURE

VISION AND MISSION

VISION:

To emerge as a centre of excellence in the field of architecture through innovative entrepreneurs with ethical values and sustainable human habitat at local and global level.

MISSION:

- To transform the department into a centre of excellence in the field of architecture through a well developed and advanced curriculum.
- To create architects with competitive skills for sustainable construction.
- To inculcate architectural professionals with innovative and ethical values to serve the nation.

The faculty of Architecture

The Council of Architecture's standards are met by the B. Arch degree offered by, FOA. The academic and professional values and standards unique to the field of architecture are intended to be integrated into the curriculum. Two levels of study are included in the program. the initial semester of six a phase two of four semesters. An architectural design project is done in the tenth semester. Students are required to complete professional training at an architectural office during their fifth year. The B. Arch program at Sharanbsava university offers a talented group of prominent faculty members who, in addition to earning degrees from top universities, bring in a lot of professional expertise. Both permanent and temporary faculty members make up the architecture faculty. Also the group includes academics from related fields such as mechanical engineering, civil engineering, and the humanities. The focus of the faculty and research will be on fusing academic theories with real: world industry experience.

PROGRAM OUTCOMES:

PO1 Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

Engineering knowledge

PO2 Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

Problem analysis

PO3 Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

Design/development of solutions

PO4 Use research: based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

Conduct investigations of complex problems

PO5 Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

Modern tool usage

PO6 Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

The engineer and society:

PO7 Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
Environment and sustainability

PO8 Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Ethics

PO9 Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

Individual and team work

PO10 Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

Communication

PO11 Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

Project management and finance

PO12 Recognize the need for, and have the preparation and ability to engage in independent and life:long learning in the broadest context of technological change.

Lifelong learning

Program Specific Outcomes (PSO):
The program specific outcomes are:
Architectural graduate will be able to

PSO:1	Apply of principles, concepts of HOA, TOA and building services for planning a building
PSO:2	Conduct survey, prepare plan for town and building, architectural and structural design and estimation of building. Apply management techniques for construction projects.
PSO:3	Prepare models, design climate responsive building. Application of vernacular architecture using latest software and documentation of vernacular architecture

I YEAR SYLLABUS

B.ARCH

21ARC11 ARCHITECTURAL DESIGN

Lectures/Week : 01	CIE Marks : 50
Studio/ Week : 07	SEE Viva Marks :50
Credits: 8	Exam :
Total Teaching Hours :112	

OBJECTIVE:

- To develop the ability to translate abstract principles of design into architectural solutions for simple problems.
- Understanding the relation between form and function.

OUTLINE	TEACHING
1. Basic human functions and their implications for space requirements. Minimum and optimum areas for various functions. User's data, movement and circulation diagrams. Spatial interpretations: various activities and their relationship with spaces. Design methodology. 2. Functional furniture layout, circulation, lighting and ventilation, for spaces such as living/dining, bedrooms, Architect's office, Doctor's clinic etc., 3. Design of simple building elements such as Gate, Welcome Arch, Memorial, Edifice, Bus Shelter and layout of parks. Imagination & technique of architectural presentation with due importance to design methodology 4. Design of Bungalows. Integration of form and function. 5. Rendering techniques learnt in visual arts should be applied for the design submissions Note: The requirements pertaining to the handicapped or disabled friendly design solutions and elderly people are to be addressed in design and detailing. Studio project The portfolio covering the above topics shall be presented for term work/ viva examination including a design submission with Model of a bungalow designed in Architectural Design with landscape of the proposal to be submitted	**112**

COURSE OUTCOME:

CO1	Apply the concepts for space required
CO2	Allocate space required for residential and Public buildings
CO3	Implement simple building elements for Entrance spaces of any area w.r.t Design methodology
CO4	Creation of Bungalows, and implementation of form and function
CO5	Apply the concepts of rendering to the building shapes .

Reference:

1. "Time Saver Standards for Architectural Design Data" by John Hanock,
2. "Architectural Graphic Standard" by Ramsay and Sleeper.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3		3										3		
CO2		2		3									3		
CO3				3									3		
CO4					3								3		
CO5	3												3		
AVERAGE	3	2	3	3	3								3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC12 MATERIALS AND METHODS IN BUILDING CONSTRUCTION-I

Lectures /Studio Per week :02	CIE Marks :50
Studio Perweek:03	SEE Marks :50
Credits :05	Exam Hours : 04
Total Teaching : 70	

OBJECTIVE:

1) To introduce students to primary building materials and simple construction techniques as applicable to a low :rise building: three to four: storied contemporary building.
2) To develop an understanding of brick bonding, foundation details, external wall section with flat roof and parapet.

MODULE	TEACHING
MODULE:I 1. Introduction to building components usage of basic building materials and construction methods: load bearing construction and framed structure. 2. Introduction to various building components and their function, various conventions used for Drawings plans; sections and elevations	**16**
MODULE:II 3. Introduction to Bricks and Tiles : Types, properties and manufacturing methods &process; uses of bricks for aesthetic & structural purpose. 4. Types of brick masonry , walls, bonds, buttress, arches ,lintels, vaults and domes. 5. Site visit : field visit to construction sites and hands on explanation of basic brick Masonry bonds.	**16**
MODULE:III 6. Introduction to cement, types of cement , properties grades and uses. 7. Introduction to sand , properties , types of sand and uses. 8. Lime : varieties, properties and uses in building 9. Lime Mortar : Preparation and application 10. Concrete Blocks : Types, sizes, qualities and manufacturing process in brief. Hollow and solid stabilized mud blocks.	**14**
MODULE:IV	

11. Foundation : Functions of foundations, types of foundations, simple load bearing foundations in brick and stone.	**14**
MODULE:V 12. Stones : Types, properties quarrying and uses of stone for aesthetic & structural purpose. 13. Stone construction : types of masonry, Stone arches, lintels, copings	**10**

Submission:
Minimum one plate on each topic, site visits to be arranged by studio teacher, study of material
Application in the form of portfolio. All the plates on construction and portfolio on material application shall be presented for term work.

COURSE OUTCOME:

CO1	Recognize different building components and application of building construction techniques for load bearing and framed structure.
CO2	Identify bricks and tiles for construction work and its application in various buildings
C03	Application of cement , sand , lime and various concrete blocks
CO4	Analyze different types of foundation in brick and stone And its utilization as per the design requirement.
CO5	Recognize and implement various types of stone and stone masonry techniques.

Reference:

"Building Construction" by W.B.Mackay
"Construction Technology" by Chudley
"Construction of Building" by Barry
"Building Constructon" by Rangawala
"Building Constructon" by Punmiya

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3													3	
CO2		3												3	
CO3			2											3	
CO4		2												3	
CO5	3													3	
AV	3	2.5	2											3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC13 ARCHITECTURAL GRAPHICS - I

Lectures/Week : 01	CIE Marks:50
Studio/ Week : 03	SEE Marks:50
Credits:4	Exam Hours :4
Total Number Of Lecture : 56	

OBJECTIVE:

1. To introduce the students to the fundamental techniques of Architectural drawings and also two: dimensional representation of built elements and built forms.
2. To develop the ability of individual students to perceive three dimensional objects and enhance visualization skills.

MODULE	TEACHING
MODULE :I Introduction to visual representation of Graphics. Introduction to the basic principles of drawing and lettering used in architectural drawings. Introduction to sign conventions used in drawings. Concept of scale, dimensioning and its application.	**6**
MODULE :II Introduction to Euclidian Geometry. Construction of lines, angles, triangles, quadrilaterals and regular polygons Introduction to development of simple surfaces of basic geometrical shapes and its application.	**15**
MODULE :III Introduction and construction techniques. Plane curves, ellipse, parabola, hyperbola and oval. Typical arch shapes	**15**
MODULE :IV Orthographic projection (First angle projection) Principles of orthographic projections and projection of points, lines, planes and solids. Projection of architectural solids, built elements and forms.	**10**
MODULE :V 5. 3D projections : Isometric and Axonometric projection a. 3D projection I : Introduction to Isometric projections and their views of solids, simple Architectural built elements and forms. b. 3D projection II : Introduction to Axonometric projections and their	**10**

views of solids, simple Architectural built elements and forms.	

Note: A consolidated portfolio containing exercises related to each of above topics are to be submitted for term work examination.
Outline: At the end of the semester, the students will be equipped with graphical skills which shall be useful in translating the graphical ideas into technically appropriate drawing presentations.

Reference:
1. IS 962 for Architectural graphics standards
2. "Engineering Drawing" by N D Bhat
3. "Geometrical Drawing for Arts Students" By IH Morris
4. "Engineering Drawing Vol I and II" by KR Gopalkrishna
5. "A primer on computer aided engineering drawing" by VTU
6. Architectural Rendering the techniques of contemporary presentation by Albert oHalse.

COURSE OUTCOME

CO1	Understand the visual representation of Architectural & graphical drawing.
CO2	Identify the simple development surfaces of basic geometrical shapes.
CO3	Recognize the different techniques in construction of objects.
CO4	Analyze the principles of orthographic projections.
CO5	Differentiate the Isometric and Axonometric projection of Architectural elements.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1										2		3			3
CO2	1	2				1				2					3
CO3	1									2		3			3
CO4	1	1		3						2					3
CO5	1									2		3			2
AVG	1	1.5		3		1				2		3			2.8

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC14 HISTORY OF ARCHITECTURE - I

Lectures/Week : 01	CIE Marks:50
Studio/ Week : 02	SEE Marks:50
Credits:3	Exam Hours : 03
Total Number Of Lecture : 42	

Objective:

1. To develop the appropriate skills of reading , discussion and writing as well as understanding the physical experience of building in order to appreciate the complexity of the influences bearing on architecture, as reflected in major historical periods.
2. Critical appreciation of work and synoptic study of architectural characteristic features from following phases & periods.

MODULE:I	
Pre historic world:primitive man, shelter, settlements, religious & burial system Ex : oval Hut, Catal Hyuyk, Henge monuments : stone Henge, & passage grave (6hr:7hr)	8
MODULE:II	
River valley cultures : Tigris and Euphrates & Nile Ex : Pyramid of cheops, temple of Khons, Karnak	8
MODULE:III	
Pre:Classical : Mycenea & Etruscan Ex : The Palace, Tiryns Ex : The Temple of Juno sospita, Lanuvium. Classical : Greek and Romn, Study of principles of Designs, Proportions, compositions and visual effets. Ex : Doric, Ionic & Corenthian orders, Optical corrections, Temple Parthenon Ex : Tuscan and composite orders and Temple Parthenon, Besilica of Tragan.	8
MODULE:IV	
5. Ecclesiastical : Early Christian, Byzantine, medival and Gothic Architecture Ex : Basilican Church of St. Peter, Roam Ex : Hagia Sophia at Istanbul. Ex : The Cathedral at Pisa. Ex : Notre Dam Paris	9
MODULE:V	
Renaissance Period (7hr:8hr) Ex : Villa Rotunda by Palladio.	9

Ex : St.Peter's Roam by Michael, Angelo and others. Ex : St.Peters Piazzaby Bernini.	

COURSE OUTCOME (CO) :

CO1	Identify the history & settlement of Pre:historic Primitive man.
CO2	Identify and apply the concept of progression of art & architecture of River valley cultures.
CO3	Distinguish between Pre:classical & classical period with the help of an example such a Mycenae, the Palace, Greek & Roman, Doric, Ionic, Tuscan etc.
CO4	Application of Ecclesiastical style in early Chritian, Byzantine Medieval & Gothic architecture.
CO5	Identify the characteristics of planning in Renaissance Period.

Reference:

1. "History of Architecture" by Benistar Fletcher.
2. Pre History of Post modernism by Marvin & Isabel

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO 3**
CO1	3														**2**
CO2			2												2
CO3	3														2
CO4	2														2
CO5		3													2
AVERAGE	2.3	3	3												2

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG15 BUILDING STRUCTURES - I

Lectures/Week : 03	CEE Marks :50
Studio/ Week : 0	SEE Marks :50
Credits:3	Exam Hours : 03
Total Number Of Lecture : 42	

Objective:

To give an introduction to the basic principles governing structural systems.

Modules	Teaching
MODULE :I Scalars and Vectors, Classification of force, force system, parallelogram law of forces, Principles of transmissibility, principle of superposition and Varignon's Theorem, Resolution and Resultant of co-planner, concurrent and non-concurrent force system.	**8**
MODULE :II Equations of static equilibrium and Free: body Diagrams. Lami's Theorem, Friction, types of friction, laws of Dry Friction, numerical problems on Blocks, wedge and ladder.	**9**
MODULE :III Support and support reactions : types of loads, supports and their significance. Concept of statically Determinate and in-determinate structures. Determination of support reactions statically determinate beams and Structures.	**8**
MODULE :IV Centre of gravity: Determination centroid of standard geometrical figures by first principle, axis of symmetry Determination of centroid of symmetrical and Asymmetrical axes of simple Lamina, Parallel Axis Theorem, perpendicular Axis Theorem moment of inertia and Radius of Gyration M.I of regular geometrical lamina by first principles Determination of M.I of simple figures (Simple numerical problems**)**	**9**
MODULE :V Analysis of Trusses : Definition of perfect, deficient, and redundant trusses.	**8**

Analysis of determinate trusses by method of joints and sections. (Simple numerical problems)	

Course Outcome (CO):

CO1	1Classify the force system and determine the resultant of force system.
CO2	Determine the forces acting on Blocks, Wedge and ladder using laws of friction.
CO3	Identify the types of loads, supports, and calculate support reactions.
CO4	Determine C.G and M.I of Geometrical properties of plane figures.
CO5	Analyze truss by method of joint and method of section.

Reference:

1) R.K.Bansal, " A Textbook of Engineering Mechanics", Laxmi Publications, 2008
2) S.S. Bhavikatti, " Engineering Mechanics", New Age International, 1994.
3) S. Ramamrutham, " Engineering Mechanics ", DhanpatRai Publishing, New Delhi, 2016.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	2												2	
CO2	3	3												2	
CO3	3	2												2	
CO4	3	2												2	
CO5	3	2												2	
AVERAGE	3	2.2												2	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3

21ART16 BASIC DESIGN AND VISUAL ARTS

Lectures/Week: 0	CEE Marks:50
Studio/ Week : 3	SEE Viva Marks:50
Credits:3	Exam :
Total Number Of Lecture : 42	

Objective:

To help student understand the basic elements and principles of design.
To introduce the techniques of creativity, observation skills and to improve sensitivity to surroundings.
To sensitize students to the multi sensory aspect of space.
To introduce to various sources of inspiration for creativity.

MODULE	TEACHING HOURS
MODULE : I • To develop an understanding of principle of design and develop a service of composition. • Various exercises on design element like line, shape, color etc.,	**8**
MODULE : II • Selection of two indoor objects/systems and observation of their situation Relationship with context, form and structure and textures and functions. • Sketching and visual representation in various media • Dimensional modeling in appropriate medium • (clay/paper/wire/plaster/wax etc.,)	**8**
MODULE : III • Free hand outdoor sketching within the campus • Using various varieties of materials on objects like solids, furniture's with various architecture elements and built forms. • Exercise of free hand pencil drawings, sketches on natural elements with various rendering techniques.	**9**
MODULE : IV • Color wheel : Primary color, secondary color, tertiary color, quaternary color, intermediate colors. • Color harmony aromatic, monochromatic harmony, chromatic harmony. • Complementary colors : Warm colors harmony, cool colors harmony, tints and shades, natural colors.	**9**

MODULE :V Making models with different materials 2D and 3D. Representation of materials in various media like paper, clay, plaster, wood, wire, wax, photography.	**8**

Course Outcome (CO) :

CO1	Learning the principles and elements of art and design.
CO2	Learning sketching through visual sketching through various like 2D and 3D.
CO3	Studying various variety of materials on solid objects and built forms.
CO4	Understanding the colors through color wheel such as primary, secondary and tertiary.
CO5	Graphics understanding of 3D composition through colors and by different medium like clay, wood etc.

References :

1)Donald Norman, 'Design of Everyday Things", Basic Books; 2 edition (5November 2013)

1. JohnBerger,'WaysofSeeing'1972,Penguin,UK
2. MaitlandGraves,'TheArtofColorandDesign',McGraw:Hill,1951
3. Robert Gill, "Rendering with Pen and Ink", Thames & Hudson; Revised, Enlarged edition (2 April19

COURSEOUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			2	2	2			3							
CO2			2	2	2										
CO3				2	3										3
CO4		2	2	2	3			3							
CO5				2	1			2							3
AVERAGE		2	2	2	2.2			2.6					2.7	2.3	3

CONTRIBUTION: 1: REASONABLE 2:SIGNIFICANT 3:STRONG

21ART17 MODEL MAKING WORKSHOP

Lectures/Week : 0	CIE Marks:50
Studio/ Week : 2	SEE Viva Marks:50
Credits:2	Exam :
Total Number Of Lecture : 28	

Objective:
To train the students in basic skills of model making, carpentry, surface painting and construction forms.

MODULES	TEACHING
MODULE : I Model making of geometrical objects such as cube, cuboids, pyramid, cone etc leading to a small two room building model with landscaping using mount board, box board etc.	**6**
MODULE : II Preparing space models using steel wires by soldering, simple welding etc. use of wax, wire metal, POP for makings spatial forms.	**6**
MODULE : III 1. Carpentry : a. Demonstration to the use of different types of tools used in carpentry. b. Painting, varnishing and melamine finishes to wooden surface and plywood. c. Demonstration of different types of joints, fixing of veneers/laminates on different types of timber surfaces i.e., teak and commercial woods viz ply, block boards, particle boards.	**6**
MODULE : IV 1)Wall painting with and without luppum by OBD, enamel etc.	**6**
MODULE :V Masonry construction : walls, arches and corbel. Marking of geometrical forms on the ground.	**4**

COURSE OUTCOME (CO) :

CO1	To acquaint with geometrical objects in 3D FORM and Creation of small building unit with landscaping to implement in small building blocks
CO2	Creating of spatial models and analyze the spatial models practically.
CO3	Application of fixtures used in construction
CO4	Application of paints for wall painting ideas
CO5	Identification and demonstration of masonry materials for better knowledge of various constructions

References :

1. Arjan Karssen and Bernard otte, “Model making: conceive, creaye and convince”, frame publishers (November 11, 2014)
2. David Neat, "Model:Making: Materials and Methods", CroWood Press,2008
3. Jocqui Atkin, "250 tips, techniques, and trade secrets for potters", Barron's Educational Series,2009
4. MattDriscoll,"ModelMakingforArchitects",TheCrowoodPressLtd,2013
5. Megan Werner,"Model making", PrincetonArchit.Press,2010
6. NickDunn,"ArchitecturalModelMaking",LaurenceKingPublishing,2014
7. Roark T. Congdon, "ArchitecturalModel Building", Fairchild Books; 1 edition, 2010

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO 3	PO4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO 3
CO1					3										3
CO2		3			3				3						3
CO3	3			3							3				3
CO4	3			2											3
CO5				3		2					3				3
AVERAGE	3	3		2.5	3	2			3		3				3

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC21 ARCHITECTURAL DESIGN - II

Lectures/Week : 1	CIE Marks:50
Studio/ Week : 5	SEE Viva Marks:50
Credits:6	Exam Hours :
Total Number Of Lecture : 84	

OBJECTIVES:
To develop the ability to generate solutions to spatial constructs, i.e., space and form which integrate principles of design with functional requirements by emphasizing the study of variables like light, movement, transformation, scale, structure & skin., physical constraints and cultural context, either urban or rural, Formal and informal housing. To develop the ability to translate abstract principles of design into architectural solutions for simple problems.

OUTLINE	
To relearn the "principles of Design" and anthropometric requirements of space planning, Study of the relationship between human body and the built environment understanding usage, spatial and thermal comfort. <u>Introduction to "Nature of Space":</u> Understanding the notions of PLACE: A "boundary", a "center" and a "spirit", PATH: A "way" and a "goal", DOMAIN: A conglomeration of paths and goals that forms a "whole" with its own "identity", Understanding the notions of "Enclosure, Ambiguity, and Transparency", "Spatial Context in formal and informal built environment. : open, closed, transition spaces", "cultural context : inclusion, exclusion, spatial segregation", Culture & Design: Understanding social attitudes to Built:form: extroverted/introverted, formal/informal, typical/individual, simple/labyrinthine, contiguous/isolated etc. <u>Introduction to "Poetics of Space":</u> light, movement, transformation, scale, structure and skin, key tools for learning: text / language as a tool; emotion, cultural, climatic, e.g.: contemplative /severe / dramatic / minimalist / natural / organic / contemporary / traditional / etc. <u>Understanding the role of Physical Context</u> : terrain, materials, structure, etc., Design process to test the learning of the semester using a multifunctional program to incorporate<u>" nature of space", "poetics of space" and "physical constraints",</u> Generation of a design brief for a multifunctional program, generation of areas based on human activity and anthropometric data, Selection a of suitable site, Idea generation, design development, & design drawings, E.g. : A House for self, Guest House, Farm house, Villa, Container house, Courtyard house, Tree house, house in an informal settlement etc. **Case study should be compulsorily carried out.**	84

Course Outcome (CO):
After completion of the course, a student will be able to:

CO1	Explore with space planning considering Anthropometry.
CO2	Apply the thermal comfort in built environment.
CO3	Convert the space to a place with social attitude in built environment.
CO4	Apply various physical aspects in design.
CO5	Explore the poetic space(transformation ,scale).

Reference:

- 'Time Saver Standards for Architectural Design Data' by John Hanck.
- 'Architectural Graphic Standard' by Ramsay and Sleeper.
- Wucious Wong.

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

C Os	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												3		
CO2		3					2								
CO3						3									
CO4			3										3		
CO5			3										3		
AVG	3	3	3			3	2						3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC22 BUILDING CONSTRUCTION & MATERIALS - II

Lectures/Week : 1	CIE Marks:50
Studio/ Week : 3	SEE Marks:50
Credits:4	Exam Hours : 4
Total Number Of Lecture : 56	

Objective:

- To comprehend the students with different types of doors and windows and contemporary construction practices pertaining to roofing systems for larger spans using timber, steel truss & concrete.

Modules	Teaching
MODULE:I 1. Doors : Types of wooden Doors, i.e., paneled, flush and glazed doors, study of joinery details. 2. Doors : Types of Doors other than wood (steel, PVC etc) study of joinery details.	16
MODULE :II 3. Windows : Types of windows (metal windows, sliding windows, glazed windows/sash, louvered windows, bay window, gable & dormer window)**,** study of joinery details.	12
MODULE :III Roof : Timber and steel trussed roof, various parts, their purposes and method of construction. 4. Timber Roof: Lean to Roof, collared roof, king post roof, queen post roof, details of joinery 5. Steel roof : Types of steel truss roofs & methods of construction	12
MODULE :IV 6. Timber : Quality of timber used in building, defects, seasoning and preservation of timber, types : Natural, hard and softwood, uses of timber for aesthetic & structural purpose 7. Uses of commercial wood in building i.e., plywood, block boards, particleboards, veneers and laminates and other types. Manufacturing processes in brief, their properties and application. 8. Introduction to various tools & equipments commonly used in construction work.	10
MODULE :V 9. Cement : Types of cement, their applications, manufacturing process, laboratory and field tests. 10. Use of AC sheet, GI sheets and aluminum sheets for roofing. 11. Other materials for covering small spans like Mangalore tiles, clay tiles, wood shingles etc 12. Introduction to types, properties, uses and application of non : ferrous metals and glass.	6

Submission
Minimum one plate on each topic shall be submitted as term work. Site visits to be arranged by studio teachers. Study of material application in the form of portfolio to be submitted.

Reference:

1. "Building Construction" by W.B. Mackay
2. "Construction Technology" by Chudley
3. "Construction of Building" by Barry
4. "Building Construction" by Rangawala
5. "Building Construction" by Punmiya

COURSE OUTCOME:

CO1	Application of types of doors suitable to the building
CO2	Identify & use of suitable types of roofs & roofing materials based on local Requirement
CO3	Application of types of windows suitable to the building
CO4	Utilization of timber & alternate materials according to type of building & availability
CO5	Analyze different types of roof coverings & its implementation based on spanning, building type & local conditions

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O1	PS O 2	PS O 3
CO1	3													3	
CO2		3												3	
CO3			3											3	
CO4	2													3	
CO5			3											3	
Averag e	2.5	3	3											3	

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC23 GRAPHICS - II

Lectures/Week : 1	CIE Marks:50
Studio/ Week : 2	SEE Marks:50
Credits:3	Exam Hours:4
Total Number Of Lecture : 42	

OBJECTIVE:
To introduce the students to the fundamental techniques of architectural drawings and to enhance their visualization skills by practice on drawing board by conventional method

MODULE	TEACHING
MODULE:I Section of solids of simple geometric objects like prism, pyramid, cone & cylinder in different positions & its true shapes of sections.	**8**
MODULE:II Development of surfaces of simple geometrical objects of prisms, pyramids, cylinder and cone.	**8**
MODULE:III Interpenetration of geometric solids of simple geometrical objects prism with prism, cylinder with cylinder, cone with cylinder, cylinder with prism.	**8**
MODULE:IV Perspective : Principles and visual effects of three-dimensional objects Study of picture plane, station point, vanishing point, eye level, ground level, their variation and their resultant effects. One point & two:point Perspective drawings of simple geometrical objects (like pyramids, cubes prisms, cylinders, cones and their combinations) & built forms.	**9**
MODULE:IV Sciography Study of Shades and shadows Principles of drawing shade and shadow with source of light is sun. Sciography for simple geometrical forms on vertical, horizontal and inclined planes Applications on Simple geometrical objects like cube, cube with a niche, prisms and pyramids etc. and their combinations: built form & perspective views.	**9**

Note: Module wise Assignments need to be given after completion of each module and to be evaluated immediately

Reference:

1. "Engineering Drawing" by N D Bhat
2. "Geometrical Drawing for Arts Students" By I H Morris
3. "Engineering Drawing Vol I and II" by KR Gopalkrishna
4. "Perspective" by SH Mullik

Course Outcome (CO):

CO1	Understand the fundamental techniques of section of solids.
CO2	Recognize the development surfaces of solids.
CO3	Explain the inter : penetration of geometrical solids.
CO4	Distinguish between the one: point &two: point perspective with solids &the built forms.
CO5	Analyze the study of Sciography for simple geometrical forms.

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1								2					3
CO2	3	1		3						2					3
CO3	3	1								2					3
CO4	3									2					
CO5	3									2					
AVG.	3	1								2					3

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC24 HISTORY OF ARCHITECTURE - II

(Indian Architecture)

Lectures/Week : 3	CIE Marks:50
Studio/ Week : 0	SEE Marks:50
Credits:3	Exam Hours : 3
Total Number Of Lecture : 42	

Objective:

- To give an introduction to culture & architecture of early civilization
- To provide an understanding of the evolution of Hindu Architecture in India in its various stylistic modes with critical appreciation, characterized by technology, ornamentation, planning practices & influences in general.

MODULE:I	
River valley cultures: Indus Valley Civilization Ex : 1) Layout of Mohenjodaro, House plan, City Citadel (Great bath & Granary) 2.Pre Classical: Aryan & Mauryan: : Salient features : Ex : VedicVillage	9
MODULE:II	
Classical : Buddhist Architecture : Mahayana phase: Ex: Great Stupa at Sanchi, Chaitya hall at karli & Vihara at Ajanta Jain Architecture : Salient features Ex: ChaumukaTemple at Ranakpur	8
MODULE:III	
Hindu Architecture Evolution of Hindu temple : Both Indo Aryan & Dravidian Ex: Early temples at Udaygiri & Sanchi, Experiments at Badami, Aihole & pattadakal Ex: Badami Caves. DurgaTemple & Ladkhan temple at Aihole, Virupakshatemle at pattadakal,	8
MODULE:IV	
Dravidian architecture Early Dravidian Architecture: Pallavas : Ex: Rathas & Shore temple at Mahabalipuram Cholas : Ex: Brihadeshwar temple at Tanjore Pandyan : Gopurams Later Dravidian Architecture : Vijayanagar : Ex: VithalaTemple at Hampi	9
MODULE:V	
Indo:Aryan Architecture: Orissa :Ex: LingarajaTemple at Bhubaneshwar Khajuraho : Ex: KhandariyaMahadev temple at Khajuraho Gujarat : Ex: Temple of Surya at Modhera Hoysala (Later Chalukyan) Architecture: Ex: Keshav temple at somnathpur	8

Course outcome:

CO1	Identify the concept of planning & settlement of River valley civilization
CO2	Application of Buddhist architecture & Jain architecture in planning of temples
CO3	Identification of planning and evolution of Hindu temple.
CO4	Distinguish between Dravidin architecture and later Dravidian architecture features.
CO5	Identify and apply the concept of planning Indo-Aryan and Hoysala (later chalukyan) architecture.

1. **References:**
2. "Indian Architecture, Buddhist & Hindu Period" by Brown, Percy
3. "Architecture of India:Buddhist & Hindu" by Grover, Satish
4. "History of Architecture in India" by Christopher, Tadgell
5. "Hindu India" by Stierlin, Henri

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO 3**
CO1	3												**2**		
CO2			2										2		
CO3		3											2		
CO4	2												2		
CO5		3											2		
AVERAGE	5	3	5										2		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG25 STRUCTURES II

Lectures/Week : 3	CIE Marks : 50
Credits:3	SEE Marks : 50
Total Number Of Lecture : 42	Exam Hours : 3

Objective:
To give an introduction to the basic principles governing structural systems and structural behavior of materials

Modules	Teaching s
MODULE:I • Simple Stresses and Strains : Concept of Deformable Bodies, Types of Stress (compressive, tensile, bending, shear) and strain (axial, shear, volumetric), Hook's law and Saintvenant's principle. concept of Temperature stresses and simple problems, Modulus of Elasticity, Typical stress:strain behavior of steel and concrete.	**8**
MODULE:II • Elastic Constants : Elastic constants, Rigidity Modulus, Poisson's Ratio, Bulk Modulus and Shear Modulus. Relations. Modulus of Elasticity and Modulus of Rigidity. Application to uniform section.	**9**
MODULE:III • Bending Moment and Shear Force Diagrams : Concept of Shear force and Bending moment. BMD and SFD for statically determinate beams subjected to combinations of concentrated and uniformly distributed load. Relationship among Load, Shear force and Bending Moment.	**8**
MODULE:IV • Bending stress in Beams : Theory of simple Bending with assumptions. Flexure formula. Bending stresses. Distribution of stress in symmetrical sections. Strength of a section, Flitched Beams.	**9**

MODULE:V • Shear stresses in Beams, Equation for shear stress distribution across a section. Shear stress Distribution for simple sections.	**8**

Reference:
1) B.S.Basavarajaih& P. Mahadevappa, "Strength of Materials", Universities Press, 3rd editn. 2010.
2) Dr. S. Ramamrutham& R. Narayan "Strength of Materials", DhanpatRai Publ., 8th edi. 2014.
3) William A. Nash, "Strength of Materials", McGraw:Hill Education; 6th edition, 2013.
4) R.K.Bansal, "Strength of Materials", Laxmi Publications; 6th edition (2017).
5) R.S.Khurmi& N. Khurmi, " Strength of Materials", S Chand Pub., revised edition 2006.

Course Outcome (CO):

CO1	Application of concepts of simple stress, strains, and deformable bodies.
CO2	Relation between Elastic constants and their application to uniform section.
CO3	Determine the SF and BM and draw the diagram for the SFD and BMD.
CO4	Distribution of Bending stress of symmetrical section and fletched beam.
CO5	Distribution of shear stress for simple beam section.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO 3	PO 4	P O 5	P O 6	P O 7	P O 8	P O 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3	2												2	
CO2	3	3												2	
CO3	3	2												2	
CO4	3	3												2	
CO5	3	3												2	
AVERAGE	3													2	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG26 SURVEYING & LEVELING

Lectures/Week : 3	CIE Marks : 50
Credits:3	SEE Marks : 50
Total Number Of Lecture : 42	Exam Hours : 3

Objective:

To develop the knowledge and skill relative to surveying and leveling principles and practice

MODULES	TEACHING HOURS
MODULE:I Definitions, principles of surveying, objects of surveying. Instruments used in chaining, metric chain, field book and different symbols used in chaining. Ranging: ranging of line using ranging rods, Construction of perpendicular by 3, 4, 5method and construction of Geometrical figures on site.	**8**
MODULE:II • **Compass Survey**: Definition, prismatic compass and its parts. Different methods of setting out, representation, plotting, **Plane table Survey**: Plan table and its accessories. Methods of plane table survey • Radiation • Intersection • Traversing • Resection	**9**
MODULE:III • **Levelling**: Definition, technical terms in dumpy level and its parts. Classification, simple leveling and differential leveling. Temporary adjustments of dumpy level. Booking and reduction of levels by Hi / Rise and fall method	**8**
MODULE:IV • **Contouring**: Characteristics of contours, methods of contouring and uses of contours	**9**

MODULE:V	
• **Theodolite**: Definition, technical terms, temporary adjustments of Theodolite. Measuring of horizontal and vertical angles Total station and its applications	**8**

Field work:

Field work to be conducted involving all above topics

- Setting out center lines of a building for a small unit.
- Construction of perpendicular on site and construction of Geometrical figures.
- To determine the distance between inaccessible points.
- Plane table survey.
- Profile leveling
- Contouring: Block level Survey.
- Demonstration of Total station.

Course Outcome (CO):

CO1	Identify the Principles of surveying.
CO2	Identify the compass survey and plane table survey.
CO3	Identify the instrument used for leveling, profile leveling.
CO4	Explain the characteristics of contours, methods of contouring and uses of contours.
CO5	Applications of theodolite and Total station.

Reference:

1.“Surveying Vol :1” by Dr. PC Punmia
2.“Surveying and Leveling (Vol :1)” by Kanetkar TP and Kulkarni SV
3.“Surveying and Leveling” by S C Rangwala

COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES MAPPING

COURSE OUTCOMES	PO 1	PO2	PO3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1		2												3	
CO2	1	2												3	
CO3	1	3												3	
CO4	1	3												3	
CO5		2			2									3	
AVERAGE	1	2.5			2									3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC27 VISUAL ARTS

Lecture /Week:0	CIE Marks:50
Studio /Week : 02	SEE VIVA Marks:50
Credits:2	Exam Hours:
Total Teaching :28	

Objective:

To give an artistic orientation to the students to enable the transition from their purely scientific background and to develop fundamental artistic skills for application in architectural drawings.

Outline:	Teaching Hours
● Freehand drawings and simple perspective in object drawing use of various drawing and sketching tools like pencils, ink pens, charcoal pencil etc. drawing, shading etc. ● Exercises in freehand drawing of household furniture, street furniture, human beings and automobiles, trees etc ● Study of object drawing and nature with light and shade. ● Rendering: use of rendering tools and materials like easels, brushes, paper (handmade, drawing sheet), water color etc. ● Working of art, type of arts : visual, performing, pop etc. appreciation of art form ● Relationship of Architecture with arts like, painting, sculpture, mural, color, fine arts, performing arts, folk art etc.	**28**

Assignment:

- Assignments consist of evaluation stage wise progress. Concerned faculty is advised to collect assignments stage wise and evaluate.

Course Outcome:

CO1	Freehand Sketches and Drawings
CO2	Simple perspectives for object.
CO3	Develop different objects of furniture and Automobile and human figures.
CO4	Analyze the dimensions of the objects, which are width, height, and depth.
CO5	Sketching and drawing in the plan layout.

Reference:

Visual Art: A Basic Study by Gajanan Bhagwat, Arvind Desai
Visual Design: A problem solving Approach by Lillian Garret

COURSE OUTCOMES WITH PROGRAM OUTCOMES AND PROGRAM SPECIFIC OUTCOMES MAPPING

COURSE OUT COMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			1	2										2	
CO2				2										2	
CO3			2	2										2	
CO4			1	2										2	
CO5			1	2						1				2	
AVERAGE			1.25	2						1				2	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC28 COMMUNICATION SKILLS

Lecture /Week:2	CIE Marks:50
Credits:2	SEE Viva Marks:50
Total Teaching :28	Exam Hours :

Objective:

1. To enable the students to develop skills in effective communication both in written & verbal.

MODULES	TEACHING HOURS
MODULE-I Introduction: Meaning, Definition, Importance & Purpose of Communication, Process of Communication, Types of Communication, Communication network in an organization, 7c's of communication, Barriers to Communication & Essentials of good Communication. Oral Communication: Meaning, Principles of successful oral communication, barriers to communication. Modes of oral communication – listening as a communication skill, Nonverbal communication. Grapevine Communication – Meaning & Types.	**6**
MODULE-II Effective writing: Purpose of Writing, Clarity in writing, Principle of Effective writing, writing personal Experiences – Describing a person, situation, memorable events etc. Drafting of Letters: Writing different types of letters - writing for employment, joining letter, complaints & follows up, Enquiries, representation etc. Official Communication – email & social media.	**6**
MODULE-III **Presentation Skills:** What is a Presentation? – Element of Presentation – Designing &delivering Presentation. Public Speaking, Effective Power Point presentation, body language, Non-verbal facial expressions, Eye Contact, audience research, questions from the audience, communication of emotional intelligence, creativity in oral communication. Communication through telephonic, video conference & Skype.	**6**
MODULE-IV Employment Communication Skills: Writing Curriculum Vitae (CV), Interview – Types of interview, Candidates Preparation, Interviews Preparation, Time Management, Grooming & Just A Minute (JAM). Speaking for better communication – speaking about yourself.	**6**

MODULE-V Interpersonal Communication Skills: Advantages& Disadvantages of utilizing the teamwork, Characteristic of Successful teams, Stages of the development of a team, team roles, challenges in team working, forms of Non- Team behaviour.	**4**

COURSE OUTCOMES: After studying this course, students will be able to understand;

CO1	Understand the meaning, importance and purpose of communication skills and identify various types of communication.
CO2	Analyze the various types of letters with different modes.
CO3	Develop presentation skills , including the ability to design and deliver.
CO4	Identify effectively use of verbal, visual and electronic modes.
CO5	Understanding the advantages and challenges of team work.

REFERENCE BOOKS:

1. Prasad P, Communication Skills, S. K. Kataria &Sons.
2. Business Communication – K. K. Sinha, Galgotio Publishing Company, New Delhi.
3. Murphy – Effective Business Communication, McGraw Hill
4. Mc. Grath - Basic Managerial Skills, New Delhi, Prentice Hall India learning pvt. Ltd.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping:

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PS O2	PSO3
CO1				3						3			-	3	
CO2										3			-	3	
CO3				3						3			-	3	
CO4										3			-	3	
CO5										3			-	3	
AVG				3						3			-	3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

II YEAR SYLLABUS
B. ARCH

21ARC31 ARCHITECTURAL DESIGN – III

Lectures/Week :01	CIE Marks:50
Studio/Week : 07	SEE VIVA Marks :50
Credits :8	Exam Hours:
Total Teaching Hours : 112	

OBJECTIVES:

- To expose the students to the grammar of creating architectural space and form.
- To study individual variables like light, movement, transformation, scale, structure and skin in the formation and evolution of architectural form.
- To explore the relationship between human feelings and architectural form.

OUTLINE	HOURS
• In the earlier part of the studio, projects shall be restricted to walls, floors, roof plans, openings, and structural elements. Functional assignment to spaces shall be avoided to restrict the dimensions of investigation. Projects shall be attempted with the help of models and sketches. • Space making projects may be tied to the context, but objective shall be illustrating the variables like color, material, texture and scale in evolving the necessary conditions for the prescribed activity. Final project shall be formulated as a process of testing the various elements of space making, learnt earlier in the semester. Ex: Nursery School, Primary Health Centre, Post Office, Bank Branch, Guest House, Restaurant etc. The design shall be sensitive to the needs of disabled, aged people and children.	112
Studio Projects: One minor exercise on first chapter and One Major Project on second chapter be presented in the form of a portfolio and two time problems (as test problems) to be submitted with the fallowing • Data collection, case studies and literature surveys • Design proposal including study model and perspective view •	

Reference:

- 'Time Saver Standards for Architectural Design Data' by John Hanck.
- 'Architectural Graphic Standard' by Ramsay and Sleeper Wucious Wong.

Course Outcome (CO):
After completion of the course, a student will be able to:

CO1	Apply the Basic Principles and Design elements in built environment.
CO2	Explore with space making elements.
CO3	Apply various design elements with context to the surrounding Public Spaces.
CO4	Explore with the forms and space.
CO5	Explore the design which is sensitive to the needs of disabled, aged people and children.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO 1			3										3		
CO 2		3													
CO 3						3									
CO 4			3										3		
CO 5			3										3		
AVG		3	3			3							3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC32 BUILDING CONSTRUCTON & MATERIALS – III

Lectures/Week –01	CIE Marks:50
Studio/Week – 03	SEE Marks :50
Credits :4	Exam Hours: 4
Total Teaching Hours – 56	

Objective:

1. To comprehend the students with construction practices pertaining to RCC, floors, roofs and flooring alternatives, masonry plastering and paint finishes.
2. To assimilate the students with the materials used in such construction practices, their properties, and effect on climate and life cycle of the building.

MODULE	Teaching hours
MODULE : I 1.Principles of staircase , construction and its elements Types of Staircases. Requirements of staircase. Construction &design of staircase – Masonry, RCC, Steel, timber, Composite. Study of fire escape staircase.	**12**
MODULE : II 1. Study of principles and methods of construction of RCC and steel foundations and columns, types of foundations – isolated, combined, Raft, Base slab, Grillage, pile foundations.	**12**
MODULE : III 1. Concrete Ingredients, grades of concrete, admixture, properties of concrete, production of concrete, mix, proportioning, mixing, transporting, placing, compaction, curing of concrete and ready mix concrete, sampling and testing of concrete. 2. Concreting under water, special concretes like light weight and high density concrete. Construction joints, expansion joints, finish in concrete, chemical admixture. Uses of concrete for aesthetic & structural purpose.	**12**
MODULE : IV Formwork and shuttering uses and applications – timber , steel and composite material. Properties and architectural uses of mild steel and stainless steel for aesthetic and structural purpose.	**10**

MODULE : V Flooring and flooring finishes – various natural and manufactured materials . types of stone flooring , granite , marble , kota, Shahbad(limestone), flagstone, wooden flooring, ceramic and vetrified tiles, concrete floors , brick on edge , Indian patent floor, granolithic , terrazzo	**10**

COURSE OUTCOME

CO1	Identification of different types of staircase and its application suitable to various buildings
CO2	Understand various types of foundation and its principles and application as per requirement.
CO3	Distinguish different grades of cement , admixtures, and its utilization to suitable areas.
CO4	Understand different types of formworks and shuttering and application as per the requirement,
CO5	Distinguish and understand different types of flooring and its implementation in building

References:

- "Building Construction" by W.B. Mackay
- "Construction Technology" by Chudley
- "Construction of Building" by Barry
- "Building Construction" by Rangawala
- "Building Construction" by Punmiya
- "Building Materials" by S K Duggal.

CO PO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	3													3	
CO 2		3												3	
CO 3		3												3	
CO 4	3													3	
CO 5	3													3	
AV G	3	3												3	

CONTRIBUTION ; 1. RE50*ASONABLE 2; SIGNIFICANT 3; STRONG**

21ARC33 GRAPHICS -III

Lectures/Week :01	CIE Marks:50
Studio/Week :03	SEE VIVA Marks :50
Credits :4	Exam Hours:
Total Teaching Hours :56	

Objective:

- Training the students in the techniques of three – dimensional presentation of built form.
- Enhance their visualization skills by practice on drawing board by conventional method

MODULE	Teaching hours
MODULE:I Perspective:Drawing of one point Perspective of interiors view of Living Room, Bedroom, and Kitchen etc. with Rendering.	12
MODULE:II Drawing of Two:point Perspective of exteriors view of built–form with landscaping etc. by Hand drafting.	12
MODULE:III Perspective drawing of built form. Free hand perspectives	12
MODULE:IV Rendering:Rendering of the perspectives using different media such as • Pencil • Pen and Ink • Color Pencils • Water Color, etc	10
MODULE:V Digital:Expressing the concept and making compositions in the sheet through software such as flash, Photo:shop, illustrator in design, sketch up etc. using the above to prepare effective drawing sheets.	10

Note: Assignments need to be given after completion of each chapter and to be evaluated immediately.

References:

1. Architectural Rendering the techniques of contemporary presentation by Albert o Halse
2. "Perspective" by S. H Mullik
3. "Rendering by Pen and Ink" by Robert W. Gill.

COURSE OUTCOME(CO):

CO1	Explain interior building with one point perspective.
CO2	Explain the two point perspective of the exterior view.
CO3	Understand the free hand perspective of build forms.
CO4	Distinguish the various media of rendering.
CO5	Digital Production and composition of rendered plans, elevation and views .

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
CO1					3					2			1		
CO2					3		2			2			1		
CO3					3					2					
CO4					3					2					
CO5					3					2		3	2		
					3		2			2		3	1.3		

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG 21ARC34

HISTORY OF ARCHITECTURE – III
(Islamic & British Architecture)

Lectures/Week –3	CIE Marks:50
Credits :3	SEE Marks :50
Total Teaching Hours – 42	Exam Hours: 3

Objective:
To provide an understanding of the evolution of Islamic and colonial architecture in India in their various stylistic modes characterized by technology, ornamentation and planning practices.

MODULE:I	
Coming of Islam : 11th century AD: **Imperial style** – understanding the evolution & characteristics features of imperial style. slave, Khilji, Tughlaq, Sayyid& Lodi Dynasties Ex: Quwaat:Ul:Islam Mosque, Qutb –Minar, Enlargement of Quwaat:Ul:Islam Mosque by Iltumish, Tomb of Iltumish, Alai Darwaza, Tomb of Ghias:Ud:din Tughlaq, Khirki masjid, Delhi, & Tomb of Feroz shah Tughlaq.	8
MODULE:II	
Provincial style:understanding the evolution & characteristics features of Provincial style. Ahmedabad, Bijapur and Deccan (Gulbarga, Bidar& Golconda). EX: Jami Masjid:Ahmedabad, Jami Masjid:Bijapur, Ibrahim Rauza:Bijapur, GolGumbaz :Bijapur, Jami Masjid:Gulbarga, Bidar Fort: Bidar, Golconda fort: Golconda	9
MODULE:III	
Moghul period: understanding the evolution & characteristics features of Mughal period.. Monumental building in the regime of Humayun, Akbar, Jehangir, Shahjahan&Aurangazeb. Ex: Humayun's tomb, FatehpurSikri (layout, Jami masijid, Buland Darawaza, Tomb of SalimChisti, diwan:I: khas), Akbar's Mausoleum, Taj Mahal, Tomb at Aurangabad, Bibika Makbara at Aurangabad& Pearl Mosque at Delhi.	9
MODULE:IV	
Arrival of British Early colonial period: The purpose & stylistic features evolved during colonial period. monumental buildings executed in the regime of East India company up to middle of 19th century Ex: St Paul's cathedral : Calcutta & Bombay town hall.	8
MODULE:V	
Later colonial period: – understanding colonial features with regional influence contribution of Edwin Lutyens and Herbert Baker to the layout and Architecture of New Delhi. Ex: Layout of New Delhi, RashtrapathiBhavan and Parliament house.	8

Reference:

- "History of Architecture in India" by Tadgel, Christopher
- "Indian architecture –Islamic period 'by Brown Percy.
- "Indian architecture –Islamic period 'by .Satish Grover
- "History of Architecture" by Sir Banister Fletcher

Course outcome(CO):

CO1	Identification of evolution and apply characteristics features of Imperial Style.
CO2	Distinguish the planning concepts and salient features Jami:masjid Provincial style.
CO3	Applying the planning concepts and layout evolution of Mugul Period.
CO4	Identification of purpose & stylistic features evolved during early colonial period.
CO5	Explain and apply the colonial features with regional influence

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3												**3**		
CO2			2										3		
CO3	3												3		
CO4						2							3		
CO5						2							3		
AVERAGE	6		2			4							3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG35 STRUCTURES – III

Lectures/Week :3	CIE Marks:50
Credits :3	SEE Marks :50
Total Teaching Hours : 42	Exam Hours: 3

Objective:
To give an insight into the structural behavior of columns and beams

MODULES	TEACHING HOURS
MODULE:I 1. Elastic stability of columns, Actual length of column, Effective length of column, Expression for Effective length of columns for various conditions (fixed, hinged, and free), No Derivations, Assumptions and limitations of Euler's Theory for critical load on long columns (No derivations)	**8 hour**
MODULE:II 2. Arch: Three hinged arch with supports at the same levels Numerical based on the above concepts parabolic and circular.	**9 hour**
MODULE:III 3. Torsion Theory: Assumptions, Torsion equation, strength of solid and hallow shaft Simple numerical examples.	**8 hour**
MODULE:IV 4. Slope deflections of cantilever simply supported and overhang beam conditions. Moment area method, Macaulay's method for simple case of loading.	**9 hour**
MODULE:V 5. Testing of materials such as Steel: tensile and impact wood: compression and deflection concrete: compression and split tensile strength	**8 hour**

Course outcome (CO):

CO1	Determine the Elastic stability of short and long columns.
CO2	Identify the basic concept of three hinged arch.
CO3	Determine the Torsional strength of shafts.
CO4	Determine the Slope and deflection of beams.
CO5	Determine the Physical properties of steel, wood, and concrete.

Reference:

1) B.S.Basavarajaih& P. Mahadevappa, "Strength of Materials", Universities Press, 3rd editn. 2010. 2) Dr. S. Ramamrutham& R. Narayan "Strength of Materials", DhanpatRai Publ., 8th edi. 2014.
3) William A. Nash, "Strength of Materials", McGraw:Hill Education; 6th edition, 2013.
4) R.K.Bansal, "Strength of Materials", Laxmi Publications; 6th edition (2017). 5) R.S.Khurmi& N. Khurmi, " Strength of Materials", S Chand Pub., revised edition 2006.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3												3	
CO2	2	3												3	
CO3	2	3												3	
CO4	2	3												3	
CO5		3												3	
AVERAGE	2	3												3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC36 BUILDING SERVICES – I

Lectures/Week :3	CIE Marks:50
Credits :3	SEE Marks :50
Total Teaching Hours : 42	Exam Hours: 3

Objective:
To impart the knowledge and skills required for understanding the building services of water supply and sanitation and their integration with Architectural design.

Outline:
To have emphasis on Services (water supply and sanitation) which includes Residence to three storied building only (such as Apartments, commercial complexes, public buildings) Etc.

MODULE	Teaching hours
MODULE – I • Water Supply • Introduction • Assessment of Water requirements. • Sources and collection • Sources of supply • Bore wells	**8**
MODULE – II • Distribution : Distribution Systems, Different types of water pipes and its materials (GI, PVC, CPVC/UPVC PIPES). • Introduction to Copper plumbing, pipe accessories, storage tanks and pumps	**8**
MODULE – III • To study about water conservation; Rain water harvesting, Drip irrigation, Recharging, Recycling and Reuse application in planning water supply systems. • Brief study of provision of water for firefighting – Fire hydrants. With reference to National Building Code – Part – IX	**9**

MODULE – IV • Introduction to sanitation and drainage • Collection and conveyance of Refuse: Waste water conveyance system, drainage in building, sewers, traps, sanitary fittings, sewer accessories.	**8**
MODULE – V • Disposal and treatment for larger project • Sewage treatment • Septic tanks • Waste and Storm water drainage system • Solid waste management • Types of Garbage •Collecting, treating and Disposing of solid wastes – Landfills and treatment.	**9**

Site Visits:

Water treatment plant, sewage treatment plant, multistoried apartments, for studying water supply
and sanitary arrangements.

Assignments:

- To design detail layout plans and sections showing details of water supply and plumbing system and underground drainage system to be submitted showing location of all fittings and fixtures in two bed room house.
- To design detailed sections of toilets and bathrooms showing fittings and appliances.
- To design three storied hostel building showing line diagram of water supply and sanitation
- Calculation of water demand for small settlement.
- To design of overhead water tank and underground water sump.

COURSE OUTCOME(CO):

CO1	Assess water requirement and identify sources for collection and supply of water.
CO2	Identify and Explain Distribution systems, Different types of water pipes, Pipe accessories, Storage tanks and Pumps.
CO3	Application of different water conservation system and water required for firefighting as per NBC.
CO4	Application of waste water conveyance system and its accessories.
CO5	Treat and Dispose liquid and solid waste.

Course Outcomes with Program Outcomes and Program Specific Outcome mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2											2		
CO2		2											2		
CO3			2					2					2		
CO4	2												2		
CO5						2							2		
AVERAGE	2	2	2			2		2					2		

CONTRIBUTION: 1: REASONABLE2:SIGNIFICANT3:STRONG

21ARC37 COMPUTER APPLICATIONS IN ARCHITECTURE – I

Lectures/Week –00	CIE Marks:50
Studio/Week – 02	SEE Marks**(VIVA)** :50
Credits :02	Exam Hours:
Total Teaching Hours :28	

OBJECTIVE

- To develop and train students to use computers and digital media as tools to explore, develop, evaluate and present architectural ideas.
- To equip the student with a range of digital tools and techniques in 2D drafting, 3D modeling

SL	MODULE:I	
1	**Introduction to 2d Drafting;**, Introduction to computer aided 2:D drafting. To develop and understand basic set up and menu bars for computer aided drafting Screen Layout: status bar, tool bar, graphics area, labeled buttons, drawing edit file handling commands (utility commands). Setting units and scale. **2D Drafting Tools Drafting**: simple and complex geometric shapes such as squares, circles, triangles, lines, curves, poly lines and their combinations etc. Application of various toolbars and their sub tools including draw, edit, modify view, file, dimension, parametric, etc.	**6**
	MODULE:II	
2	**2D Drafting of Building:** Preparation of two dimensional architectural drawing incorporating layers, line:weights, texts, scale, dimensioning and formatting of drawings for taking prints and plots And Modeling of Walls, Doors, Windows, Stairs etc. **2D Presentation Drawings:** Preparation of two dimensional architectural presentation drawings (including plans, elevations and sections) incorporating human figures, plants, car etc. Preparation of two dimensional architectural presentation drawings (including plans, elevations and sections) incorporating grid, column, dimensioning, legend and architectural elements details with proper line weight etc.	**6**
	MODULE:III	
3	**Practical Work :** Making 2 dimensional architectural plan, elevation and sections for any one of the architectural design assignments studied in previous semesters with submission in the form of printouts in scale.	**6**
	MODULE:IV	
4	**Introduction to AutoCAD 3D modelling:** Latest version of relevant	**6**

	3D modeling software, software interface, demonstration of 3D modelling commands required to convert 2D project (of 2D drafting) into 3D.	
	MODULE:V	
5	**3D modelling:** drawing quickly with basic shapes in3D, viewing models in 3D, adding detail to Models in 3D space, use of cameras, material applications. Presenting models.	**4**

COURSE OUTCOME:

With the successful completion of the course student should have capability to

CO1	Apply basic CAD Concepts to 2D Geometry shapes.
CO2	Draw Walls, Doors, Windows, Stairs using Auto CAD Software.
CO3	Prepare plan, elevations, sections, of a single storied building using 2D Drafting.
CO4	Apply 3D Modeling to convert 2D drawings into 3D.
CO5	Perform photo realistic rendering of the building project using Autocad 3D.

SOFTWARE FOR REFERENCES

1. AutoCAD Student Version
2. Sketch:Up.
3. DraftSight
4. FreeCAD

Books for References : AP Gautam, Pradeep Jain, Engineering AutoCAD

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	3				3			3				3		3	
CO 2					3			3				3		3	
CO 3					3			3				3		3	
CO 4					3			3				3		3	
CO 5					3			3				3		3	
AV G	3				3			3				3		3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC38 MEASURING DRAWING AND DOCUMENTATION

Lectures/Week –00	CIE Marks:50
Studio/Week – 01	SEE Marks (VIVA):50
Credits :1	Exam Hours: :
Total Teaching Hours 14	

OBJECTIVE:

To understand the character of a settlement, street, building, spaces, materials through a process of measured drawings and photographic documentation.

Sl.	OUTLINE	TEACHING HOURS
1	Introduction to Documentation : Need for Documentation undertaken? Tools for Documentation available, Methodology, Importance of Archival research, Old Photographs, Maps etc. Selection of Historical site / 100 year old planned layout / residence.	14
2	Site work Secondary information on the /street/heritage Reconnaissance survey of the /street/heritage building; Mapping of the street Identification of selected typology of structures for detailed measured drawing Recording of measurements: horizontal, vertical, measuring angles, marking center lines, datum, notations, building orientation Legend of materials used; Structural details and joineries Details of various elements – openings, ornamental details Mapping activities in various locations Supporting sketches Information on people, surroundings, climate, Access to site.	
3	Preparation of Drawings Developing drawings from the field data – Plans at various levels, Building floor plans, Reflected ceiling plans, roof plans, all elevations, relevant sections. Drawings of details such as openings, ornamental details, joineries	
4	Analysis: Analysis as tools for understanding and interpreting the measured drawings	

Note: The assignment may be given as group work (4 to 5 students per group). The students have to submit a report on the measured drawing & study tour separately. The reports are to be assessed by the departments for Continuous Internal Evaluation and final review has to be conducted.

REFERENCES:

1) RSP Program Monographs –CEPT University
2) Building Craft Lab: DICRC, CEPT University

COURSE OUTCOME

With the successful completion of the course student should have capability to

CO1	Explain the need and scope of project documentation.
CO2	Implement the research and site study of documentation in design.
CO3	Understand the design concepts and prepare the site plan, street and the layout of project.
CO4	Prepare the various levels of planning of documentation.
CO5	Analyze the various tools to measure and implement them in survey.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	3				3			3				3		3	
CO 2					3			3				3		3	
CO 3					3			3				3		3	
CO 4					3			3				3		3	
CO 5					3			3				3		3	
AV G	3				3			3				3		3	

SYLLABUS CONTENT OF IV SEMESTER B.ARCH.
21ARC41 ARCHITECTURAL DESIGN – IV

Lectures/Week :01	CIE Marks:50
Studio/Week: 07	SEE VIVA Marks 50
Credits :8	Exam Hours:
Total Teaching Hours : 112	

Objective:

- To understand the meaning to cultural and physical context of built environment and techniques of reading such contexts considering the philosophy of reputed architects
- To isolate the various factors of the context which influence the design of built environment.
- To understand the nature of place making as an architectural goal

OUTLINE	TEACHING HOURS
Studio project shall be based on case studies literature survey and analysis leading to form generation and realization of the objective. • Functional assignment to spaces shall be avoided to restrict the dimensions of investigation. Projects shall be attempted with the help of models and sketches. • Space making projects may be tied to the context, but objective shall be illustrating the variables like color, material, texture ,scale and forms in evolving the necessary conditions for the prescribed activity. Final project shall be formulated as a process of testing the various elements of space making, learnt earlier in the semester.	**112**

Studio Project

The studio project shall include various problems of level such as School, Hotel, Motel, children's' library, Recreation Club, Museum, Polyclinic, and Nursing home etc.
The design shall be sensitive to the needs of disabled, aged people and children.

Submission

One major project and one minor problem and two time problems

- Data collection, case study and literature survey
- Design proposal including study model and perspective view

COURSE OUTCOME:
After completion of the course, a student will be able to:

CO1	Ability of the basic necessary requirements restricted to walls, floors, roof plans etc
CO2	Implement the architectural bye : laws in construction and various services involved in the design of a building.
CO3	Understand about the material, color, texture etc. used in the particular climate.
CO4	Prepare details of architectural features and elements for buildings/built form.
CO5	Apply the relationship between form, spaces and aesthetics in design or construction.

REFERENCE:

- Time:Saver Standards on Housing and development.
- The Architecture of Hasmukh C Patil: Selected Projects 1963:2003 – Catherine Desai Bimal Patel.
- Factories & office buildings: CarlesBroto.

CO PO MAPPING

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1		2			3			3				3			
CO2					3	2	3	3						2	
CO3								2							
CO4					3			2							
CO5					2			3							
AVG		2			3	2	3	2.6				3		2	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC42 BUILDING CONSTRUCTION & MATERIALS – IV

Lectures/Week :01	CIE Marks :50
Studio/Week :03	SEE Marks : 50
Credits :4	Exam Hours: 4
Total Teaching Hours : 56	

Objective:

- To assimilate students with construction practices pertaining to RCC floors, roofs and flooring with different materials and plastering.
- Study of principles and methods of construction of slabs including form:work techniques and reinforcement details for RCC Construction.

MODULES	TEACHING HOURS
MODULE:I Introduction to RCC slabs : one way, two way slabs, and cantilever slabs, sloping RCC roof,	**12**
MODULE:II Alternate roofing techniques: vaults, domes, Madras terrace roof, Jack arch roof, Hollow clay blocks roofing techniques (filler slab)	**12**
MODULE:III Earth Retaining walls, Shoring, Underpinning, Ferro cement elements	**12**
MODULE:IV Construction Joints & Expansion joints – Necessity, location and detailing, Chemicals admixtures, Grouts, repairs and protective coatings, bonding agents, sealants and water proofing and weather proofing compounds, tile adhesives, tile joint filers, shotc	**10**
MODULE:V Plastering, pointing & finishing Paints, distemper's, emulsions, cement base paints & Constituents of oil paints, Characteristics of good paints, types of paints and process of painting different surfaces. Varnishes: Types of varnish, methods of applying varnish and fresh polish and melamine finish.	**10**

Submission – Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. Study of material applications in the form of portfolio.
The entire portfolio on Construction and Materials shall be submitted along with study models.

COURSE OUTCOME:

CO1	Identify different types of RCC Slabs & its application suitable to building spans
CO2	Recognize alternate roofing techniques & its utilization suitable to various building designs
CO3	Implementation of different geotechnical components such as earth retaining wall, shoring, underpinning & Ferro cement elements
CO4	Identify the Joints, properties of different building construction chemicals & its utilization in construction industry
CO5	Identify & analyze the application of various internal & external finishes used in buildings depending upon the suitability.

Reference:

- "Building Construction" by W.B. Mackay
- "Construction Technology" by Chudley
- "Construction of Building" by Barry
- "Building Construction" by Rangawala
- "Building Construction" by Punmiya
- "Building Materials" by S K Duggal.

CO PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO 2**	**PSO 3**
CO1		3												3	
CO2		3												3	
CO3		3												3	
CO4	2													3	
CO5		2	3											3	
Average	2	2.5	3											3	

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC43 CLIMATOLOGY

Lectures/Week :02	CIE Marks:50
Studio/Week : 01	SEE Marks :50
Credits :3	Exam Hours: 3
Total Teaching Hours :42	

OBJECTIVES:

- To understand the elements of climate and its classification and thermal comfort .
- To understand the overheated and under heated period, sun path diagram , thermal performance of a building .
- The understand the concept of thermal heat gain and loss , techniques for thermal insulation
- To understand the concept of shading devices and natural ventilation.
- To understand the concepts and types of natural day lighting and climatic considerate design .

MODULES	TEACHING HOURS
Module I Introduction to Climate **1. Introduction to Climate:1:** The Climate :built form interaction; some examples. Elements of climate, measurement and representations of climatic data. Classifications and Characteristics of tropical climates. **2. Introduction to Climate:2:** Major climatic zones of India. Site Climate: Effect of landscape elements on site/micro climate. **3. Thermal comfort:1:** Thermal balance of the human body, Thermal Comfort Indices (Effective temperature, corrected effective temperature, bioclimatic chart, tropical summer index by CBRI Roorkee). Measuring indoor air movement: Kata:thermometer, and measuring indoor radiation: Globe thermometer.	8 hours
Module:II Thermal comfort **4. Thermal comfort:2:** Calculation of Overheated and Under heated period (based on air temperature only) for locations in Climatic zones and their optimization in terms of solar heating and Passive cooling desired. **5. Sun:path diagram:** Solar geometry & design for orientation and use of solar charts in climatic design. **6. Thermal performance of building elements:** Effect of thermo:physical properties of building materials and elements on indoor thermal environment. Convection, Radiation, concept of Sol:air temperature and Solar Gain factor.	9hours

Module:III Thermal Heat gain or loss **7. Thermal Heat gain or loss:** Steady state and periodic heat flow concepts, Conductivity, resistivity, diffusivity, thermal capacity, time lag and 'U' value. Calculation of U value for multilayered walls and Roof, Temperature Gradient, Inference of time lags from Graphs for walls and Roof. Construction techniques for improving thermal performance of walls and roofs. (Effect of density, Insulation, and Cavity).	9 hours
Module:IV Shading devices **8. Shading devices:** Optimizing Design of Shading devices effective for overheated periods while allowing solar radiation for under heated periods for different wall orientations. **9. Natural ventilation:** Functions of natural ventilation, Stack effect due to thermal force and wind velocity. Air movements around buildings, Design considerations and effects of openings and external features on internal air flow and Wind shadows.	8 hours
Module:V Day Lighting Nature of natural light, its transmission, reflection, diffusion, glare. Advantages and limitations in different climatic zones, North light, Daylight factor, components of Daylight devices. **11. Climatic Design considerations:1:** Literature study of relevant traditional and contemporary building examples. **12. Climatic Design considerations:2:** Two Indian case studies and one international for each climatic zone.	8 hours

REFERENCE:

1. Koenigsberger, Manual of Tropical Housing & Buildings (Part:II), Orient Longman, Bombay, 1996.
2. Arvind Kishan, Baker & Szokolay, Climate Responsive Architecture, Tata McGraw Hill, 2002.
3. Martin Evans; Housing, Climate, and Comfort; Architectural Press (1 March 1980)
4. Donald Watson and Kenneth Labs; Climatic Building Design : Energy:Efficient Building Principles and Practice; McGraw:Hill Book Company, 1983.

5. Mili Majumdar (Editor); Energy Efficient Buildings in India; The Energy and Resources Institute, TERI (28 February 2009)
6. Baruch Givoni; Passive and Low Energy Cooling of Buildings; John Wiley & Sons (1 July 1994).
7. Energy Conservation Building Code (ECBC) 2007; Bureau of Energy Efficiency, Ministry

of Power, Government of India.

COURSE OUTCOME:

CO1	CO1:To investigate the elements of climate and its classification to improve thermal comfort of buildings .
CO2	CO2:To analyze the overheated and under heated period, sun path diagram to improve thermal performance of a building .
CO3	CO3:The utilize the concept of thermal heat gain and loss and apply the techniques for thermal insulation
CO4	CO4: To consider the concept of shading devices and natural ventilation and apply in design.
CO5	CO5:To analyze the concepts and types of natural day lighting and climatic considerate design and implement in design.

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2			2				3							1
CO2	3							3							2
CO3	2			2											3
CO4						2									3
CO5						3									3
AVG	2.3			2		2.5		3							2.4

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC44 HISTORY OF ARCHITECTURE – IV

(Modern Architecture)

Lectures/Week :3	CIE Marks:50
Credits :3	SEE Marks **:**50
Total Teaching Hours :42	Exam Hours: 3

Objective:
To provide an understanding of evolution of modern architecture and high modernism in India and Abroad.

MODULE:I	
Impact of Industrial Revolution on Architecture: The social, Economic and political changes, affected, requirements of the society, new materials and technological development. Birth of various styles and movements such as Beaux art, Chicago school, Bauhaus, De stijl movement, Art Nouveau etc. Study of examples: Crystalpalace atLondon, Wain Wright building by Adler and Sullivan, Bauhaus school at Dessau by Walter Gropius, Paris Metro Station entrance, Schroder House by Rietveld	8
MODULE:II	
Study of the works of masters: Antony Gaudi: Casamila and SagradaFamilia Le Corbusier – Villa Savoy and Ron Champ Cathedral F.L.Wright – Falling Water House and JohnsonWaxTower Mies van der Rohe : Farnsworth House and Seagram building KenzoTange – National Gymnasium for Tokyo Olympiad , Kagawa Prefectural center Louis: I khan – RichardMedicalResearchBuilding, Philadelphia and First Unitarian Church And School	9
MODULE:III	
Study of other architects who contributed to development of modernism EeroSaarinen – Trans world Air Line Terminal Paul Rudolph : ArchitectureSchool At YaleUniversity. Richard mier – Smith House	9
MODULE:IV	
Modern architecture in India: : (8hr:9hr) Study of the works and philosophy of Foreign architects. Le:Corbusier : Capitol complex at Chandigarh Louis:I:khan – IIM Ahmedabad J. A Stein – IIC at New Delhi, International Kashmir center at Kashmir Roger Anger – works at Auroville , Pondicherr	9
MODULE:V	
Study of the works and philosophy of Indian architects A.P.Kanvinde –Nehru science center Mumbai. BVDoshi – IIM,Bangalore and SanghatAhmedabad	8

Charles correa – KanchanJunga apartments at Bombay Uttam . c .Jain : KotaEngineeringCollege ,Jodhpur university, Raj Rewal – Asiad village at Delhi, Pavilion at PragatiMaidan New Delhi. Laurie Baker – Center for Development studies Thiruvananthapuram, St. John's cathedral Thiruvalla.	

Reference:

1. "Modern architecture –A Critical history" By Frampton Kenneth
2. "A History of Architecture" by Fletcher Bannister
3. "Pre History to Post Modernism" by Marvin &Isabell.
4. "Modern architecture in India "by Bahga and Bahga&Bahga
5. Contemporary Indian Architecture:After The Masters – Vikram Bhatt and Peter Scriver

COURSE OUTCOME:

CO1	Application of industrial revolution impact on architecture.
CO2	Identification and apply of famous works of master architects in design concepts.
CO3	Explain and apply the contribution of modern architects in development of modernism style.
CO4	Application of philosophy of Modern architect in planning and design development.
CO5	Application of philosophy of Indian architect in planning and design development.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1						3							**3**		
CO2		2													
CO3		3													
CO4		3													
CO5		3													
AVERAGE		3				3							3		

CONTRIB3TION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG45 STRUCTURES – IV

Lectures/Week:3	CIE Marks:50
Credits :3	SEE Marks **:**50
Total Teaching Hours :42	Exam Hours: 3

Objective:
To give an insight into the structural behavior of portal frames.

MODULE	TEACHING HOURS
MODULE:I 1. Propped beam: Analysis of propped beam development shear force and BMD numerical examples on simple loading case (Point load & UDL)	**8 Hours**
MODULE:II 2. Fixed beams: Behavior of fixed beam. Analysis of fixed beam subjected to point load and uniformly Distributed load development of SF, BM, and elastic curve with numerical examples	**9 Hours**
MODULE:III 3. Clapeyron's three moment method: Clapeyron's theorem derivation of Clapeyron's three moment equation. Numerical examples on simple loading cases.	**8 Hours**
MODULE:IV 4. Moment distribution method: Stiffness, carry over theorem, distribution theorem. Analysis of continuous beams by moment distribution method.	**9 Hours**
MODULE:V 5. Analysis of portal frames: :single bay single storey with non sway by moment distribution method	**8 Hours**

COURSE OUTCOME:

CO1	Analyse the propped beam and draw SFD and BMD.
CO2	Analyse the fixed beam and draw SFD and BMD.
CO3	Analyse the Continuous beam by Clapeyron's method.
CO4	Analyse the Continuous beam by moment distribution method.
CO5	Analyse the portal frames single bay single storey with non:sway by moment distribution method.

Reference:

1." By RamamruthamDhanpatRai publishing company New Delhli
2. "Basic structural analysis" by C.S. Reddy Tata mcgrawHill,New Delhi
3."Strength of materials and Theory of structures" by B.C Punmia& R.K Jain vol I & VolII Laxmi publication New Delhi
4. "Analysis of structures" by Thandav Murthy Oxford university of Press

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
CO1			3											3	
CO2			3											3	
CO3			3											3	
CO4			3											3	
CO5			3											3	
AVERAGE			3											3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC46 BUILDING SERVICES – II

Lectures/Week :2	CIE Marks:50
Credits :3	SEE Marks **:**50
Total Teaching Hours:42	Exam Hours: 3

Objective:
To make students aware about the different electrical services and make them introduced to illumination. And the use of these into the Architectural projects

Outline:
To make students understand the electrical services such as Wiring, Earthing etc. and study as a whole to sensitize them towards the Architectural design.

MODULE	Teaching hours
MODULE – I • Introduction to Electrical services in the building. Basic terminologies used in them • Distribution of Electric supply/ Electric current inside the buildings. This includes detailed study of Transformers, AC Current, DC Current, Resistors, Capacitors, Voltage etc. To make them understand about Generators, Panel boards, low tension panels, overhead and underground distribution systems	**8**
MODULE – II • Brief description about various types of wiring, PVC Casing and Capping wiring systems in detail, House wiring • Distribution of power to various appliances, process of electrification.	**8**
MODULE –III • Necessity of Earthing in buildings, types of earthing. ii. Protective devices : Fuses, MCB, ELCB, Lightening arrestor • Lighting circuits, study of power circuits in detail.	**8**
MODULE – IV • Introduction to Quality and quantity of light. • Systems of Luminaries : Direct and Indirect etc	**9**

• Various types of electrical lamps – Incandescent, flouroscent/ CFL, HID'S, Neon lamps and their lighting characteristics.	
MODULE – V • Estimation for Electrification and load estimation • Indian electricity rules – Relevant codes of practice.	**9**

Submission:

- Estimation and preparation of a lighting and electrical scheme showing electrical fixtures using terminology and load distribution diagram for a small industrial work area, classroom etc.

Course Outcome :

CO1	Identify Electrical Services in the building and distribution of Electrical supply/ Electric current.
CO2	Application of various types of wiring, and distribution of various appliances.
CO3	Application of types of earthing, protective devices and Explain lighting circuits in detail.
CO4	Identify quality and quantity of light, System of luminaries and various types of Electric lamps.
CO5	Estimation of electrical load and application of relevant codes.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2												2	
CO2	2													2	
CO3	2													2	
CO4			2											2	
CO5				2										2	
AVERAGE	2	2	2	2										2	

CONTRIBUTION: 1: REASONABLE 2:SIGNIFICANT3: STRONG

21ARC47 COMPUTER APPLICATIONS IN ARCHITECTURE – II

Lectures/Week –1(0Lecture+2Seminar)	CIE Marks:50
Credits :2	SEE Viva Marks**:**50
Total Teaching Hours :28	Exam Hours:

OBJECTIVE :

To develop required skills in preparation 3 dimensional drawing using computers.

MODULE:I	
Introduction to 3Ds Max: Importance of 3DS Max for Architecture Students, Creating all type of Standard, Extended, Primitive objects, Creating Doors, Windows and Stairs according to parameters, Creating all types of shapes like Circle, Line and Ellipse etc. Convert all solid objects into Editable Mesh, Convert all shapes in Editable Spline and Editable poly.	**4**
MODULE:II	
Introduction to Material Textures and maps concept of Texturing and Adding material : Introduction to Material Editor, color concepts Texturing with Bitmap Files, Apply Material on surface, UVW Mapping Tilling , UVW Mapping Tilling ,Architectural Maps. Importing AutoCAD 2D Building Plan File in 3Ds Max And Importing AutoCAD 3D Building Model File in 3Ds Max.	**6**
MODULE:III	
Lights, Camera – Introduction To lights, types of lights, lights parameters, Application on lights in interior and exterior. Introduction to Camera, Application and utilities of camera, types of camera, parameters of camera. **Rendering Model View using Default Scan line Renderer.**	**6**
MODULE:IV	
Introduction to photo shop :Use of photo shop, Editing images, Create documents, Photo shop system requirements, Photo shop FAQ'S. **Work space**: Workspace basics, Create documents, Photo shop search, Use the touch bar, Microsoft dial support, Tool galleries.	**6**
MODULE:V	
Image and color basics: How to resize images, Image essentials, Image size and resolution, Acquire images from cameras and scanners, Create, open and import images, View images. **Layers** – Layers basics , Create and manage layers and groups, Place images into frames, Nondestructive editing, Select, group, and link layers, Layer opacity and blending.	**6**

COURSE OUTCOME:

With the successful completion of the course student should have capability to .

CO1	Apply basic 3ds max Concepts to 2D Geometry shapes And Draw Walls, Doors, Windows, Stairs using 3D'max software
CO2	Apply basic 3ds max Concepts to 2D Geometry shapes And Draw Walls, Doors, Windows, Stairs using 3D'max software .
CO3	Apply 3D Modeling to convert 2D drawings into 3D Model.
CO4	Perform photo realistic rendering of the building project using 3D'max software.
CO5	Ability to prepare documents, Work space using photo shop.

SOFTWARE FOR REFERENCES

1. AutoCAD Student Version
2. Autodesk Revit
3. Sketch:Up
4. Paint 3D
5. 3D Max

REFERENCES: Pradeep Jain & A.P. Gautam, Engineering AutoCAD

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3				3			3				3		2	
CO2					3							3		3	
CO3					2			3				2		3	
CO4					2			3				3			
CO5					2			3				2			
AVG	3				2.4			3				2.6		2.6	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC48 WORKING DRAWING - I

Lectures/Week :1	CIE Marks:50
Studio/Week :2	SEE Viva Marks **:**50
Credits :3	Exam Hours:
Total Teaching Hours :42	

Objective:
Introduction of working drawings and Details: Coordination between Architectural, Structural, Services and otherdisciplines, Preparation of Architectural Working Drawings for a design project

MODULE	TEACHING HOURS
MODULE:I Conventional Method: Architectural Drafting – lettering, Dimensioning Line,Title Block, Office Standard.	**8**
MODULE:II Load Bearing Structure: Center line plan, Measuring Drawing , Foundation plan , Floor plan working plan showing the details of wall and openings, elevation,section, (manual Drafting)	**9**
MODULE:III Site plan/Permission/Approval Drawing SOP, Schedule of opening (Door, window, grills)	**8**
MODULE:IV Load Bearing Structure: detail measuring drawing of plumbing and Detailmeasuring drawing of electrical layout	**9**
MODULE:V Detail drawing of kitchen or toilet Flooring Details, Sop, Schedule of opening(manual Drafting)	**8**

Portfolio:

- The above drawing need tp be prepaid for one design projection of Residence One set of drawing need to be prepaid on AUTOCAD for one design projection for mulity story framed structure.
- This enterer team work to be prepared for Vivo Examination.

Course Outcome (CO)

CO1	Identifying and applying different conventional method of architecture in practice
CO2	Prepare working drawing for load bearing structures
CO3	Prepare detailed site, permission / approval drawing as per bylaws
CO4	Prepare detailed working drawing for load bearing
CO5	Prepare detailed working drawing for kitchen or toilet

Reference:

- Metric Architectural Construction, Drafting and Design fundamentals by William J Hornhung
- Working Drawings Hand Book by Keith Styles
- General Architectural Drawing by William E Wyatt.

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3				3			3				3		2	
CO2					3							3		3	
CO3					2			3				2		3	
CO4					2			3				3			
CO5					2			3				2			
AVG	3				2.4			3				2.6		2.6	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

III YEAR SYLLABUS
B.ARCH

SYLLABUS CONTENTS OF V SEMESTER B.ARCH
21ARC51 ARCHITECTURAL DESIGN – V

Lectures/Week : 01	CIE Marks : 50
Studio/ Week : 05	SEE Viva Marks : 50
Credits: 6	Exam Hours:
Total Teaching Hours :84	

OBJECTIVES:

- To understand the use of technologies developed in other fields as a precursor for creating architecture.
- The design shall deal with multiple functions resulting in complex form.
- The design shall be sensitive to the needs of disabled, aged people and children
- To understand creating of spaces. Formal, informal and interactive spaces and their Hierarchies in built environment.
- To understand regarding services to be provided i.e., Working operating and their maintenance.

OUTLINE	TEACHING HOURS
Design emphasis shall be laid on techniques of construction for achieving the thermal comfort and energy efficiency for a given context. The design shall be mainly addressing to the local issues and construction processes. **STUDIO PROJECT**: Studio project shall include problems involving above considerations such as institutes, Residential schools, shopping complex, medium rise buildings, medium size apartments (G+3), Single function Sports Complex, etc. One major project and a time problem to be tackled in the semester. Detailing of architectural features of the major project has to be attempted. • Study of various building techniques and planning methods adopted in building for achieving thermal comfort and energy efficiency. • Study of structural system adopted. **SUBMISSION:** Case study, data collection, literature survey, Design proposal including study model , Detailing of architectural features involved shall be attempted.	84 Hrs

REFERENCE:

- Time:Saver Standards on Housing and development.
- The Architecture of Hasmukh C Patil: Selected Projects 1963:2003 – Catherine Desai Bimal Patel.
- Factories & office buildings: CarlesBroto.

COURSE OUTCOME:

After completion of the course, a student will be able to:

CO1	Design the project by implementing the constraints like local bye –laws, and various services.
CO2	Explore the designs that are sensitive to the needs of disabled, aged people and Children.
CO3	Develop the built environment, incorporating thermal comfort and energy efficient.
CO4	Prepare the details of architectural features and elements for buildings/built form.
CO5	Apply the relationship between form, space sand aesthetics in design or Construction.

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1		3			2							3		
CO2			3	2			3								
CO3			3				3				2				
CO4						2					3				
CO5			1	3	2								3		
AVG	1		2.5	2.5	2	2	3				2.5		3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC52– BUILDING CONSTRUCTION – V

Lectures/Week : 01	CIE Marks : 50
Studio/ Week : 03	SEE Marks : 50
Credits: 4	Exam Hours: 04
Total Teaching Hours :56	

OBJECTIVE:
Building course with emphasis on study and analysis of different advanced building components with sensors and its manufacturing process.
Study of aluminum as a building material and different cladding materials

MODULE	TEACHING HOURS
MODULE:I PVC & FRP, frameless glass doors and windows and partitions. Wooden, steel, Aluminum sliding and folding doors and partitions.	12
MODULE:II Steel doors for garages and workshops.	12
MODULE:III Collapsible gate and rolling shutters .use and manufacturing method. Remote control system for doors windows and gates.	12
MODULE:IV Aluminum as a building material Types , properties uses and manufacturing method, detailing of aluminum partitions. Aluminum doors windows : casement , pivot ,sliding type. False ceiling , types details of various materials.	10
MODULE:V Structural glazing, aluminum composite panel. Cladding and fixing details.	10

Submission :
Minimum one plate on each construction topic. Site visits to be arranged by studio teachers.
The entire portfolio on construction shall be presented for term work.

Course outcome:

CO1	Understand and analyze different types of doors/ windows like PVC , FRP , frameless glass door and its application.
CO2	Compare and apply types of steel doors for garages and workshops
CO3	Recognize collapsible door and rolling shutters , remote control for doors and windows..
CO4	Analyze aluminum as a building material and its utilization in building construction.
CO5	Recognize structural glazing , and different cladding technique and its implementation in construction .

Reference:

"Construction Technology" by Chudley
"Construction of Buildings" by Barry
"Building construction" by Frank Chi

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
CO 1	3													3	
CO 2	3													3	
CO 3			3											3	
CO 4		3												3	
CO 5			3											3	
AV G	3	3	3											3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC53 BUILDING ECONOMICS & SOCIOLOGY

Lectures/Week : 02	CIE Marks : 50
Credits: 02	SEE Marks : 50
Total Teaching Hours :28	Exam Hours: 03

Objective: The objective of the subject is to enable students to understand:

- Society and it's issues
- Influence of Society on Architecture
- Basic principles of building economics at macro and micro levels

MODULE	TEACHING HOURS
Module:I Introduction to Sociology: Definition of Sociology; Nature, Scope and Utility of Sociology; Branches of Sociology; relation between Sociology and society. Essential elements of society, bio-social and socio-cultural systems. Rural and urban communities and their characteristics. Origin, growth and influence of cities. Definition of urbanization –patterns of life and influence of urbanization on rural life, urbanization process in India.	**6**
Module:II Migration and its impact on urbanization, social problems of urbanization – problems relating to public health, public transport and public housing, sociological understanding of slums. Type of social setup influencing architecture. Variations in design solutions arising out of social setup. Type of community, religion, culture and politics playing role in defining architecture.. Concepts of CPTED (Crime prevention through Environmental Design) in architecture.	**6**
Module:III Social surveys and Social research – The need for research; the research process; ethics of social research; principles of social research, scope of research, units of study, choice of research topics, Difference between methodology and methods. Types of research methods: qualitative, quantitative, mixed research methods. Sources of information or research data: primary and secondary sources. Secondary data sources include literature review, official and unofficial documents, library references, publication etc.,. Primary data sources use methods such as field surveys & adoption of suitable techniques in field research viz, questionnaires,	**6**

different types of interviews (open:ended / closed / structured / semi: structured),and case study approach etc., analysis and classification of data.	
Module:IV Definition of Economics, Economic laws, Economic goods, utility, value, price and economy affordability, wealth. Economic organization of society: Consumption, wants, their characteristics and laws based upon them. Concepts of economics: Standard of living, market value, opportunity cost, the laws of diminishing, increasing and constant returns. Urban land values, land utilization, factors involved in Development of urban land. The Bid Rent theory that defines relationship between location and land value. Theoretical city models based on land use and land value– Burgess's Concentric Zone Theory; Hoyt's Sector Theory; Ullman and Harris's Multiple Nuclei Theory.	**6**
Module:V Concepts of life cycle costing with reference to buildings. Time value of money present worth and inflation. Different Sources of finance for buildings. Architecture evolving out of affordability and constraints of economy. Contribution of various architects towards low cost construction.	**4**

COURSE OUTCOMES:

CO1	Distinguish between sociology Vs society, Urban Vs rural communities & analyze the process of urbanization in India
CO2	Analyze migration process, its impact on urbanization or on social set ups influencing architecture & application of concepts like CPTED accordingly.
CO3	application of core concepts of social surveys, social research & their methodologies
CO4	Identify basic economics, its fundamental concepts & various theoretical models based on land use & land value
CO5	application of economic principles like building life cycle costing, building sources of finance & various architects contribution towards low cost housing

References:

- Pannerselvam R, Engineering Economics, Prentice Hall India, New Delhi, 2000
- Bruce, Steve, Sociology: A very short Introduction, Oxford University Press, Oxford, 1999
- OpenstaxCollege(2012) Introduction to Sociology. OpenstaxCollege.
- Samuelson, P. and Nordhaus,W.(2010) Economics. Mcgraw: Hill Education.
- Yin, Robert K. (2014) Case Study Research Design and Methods (5th Ed.). Thousand Oaks, CA:Sage.
- Groat, Linda N. and David Wang (2013) Architectural Research Methods (2nd Ed.). John Wiley & Sons.
- Jones, Paul (2011). The Sociology of Architecture: Constructing Identities. Liverpool

University Press.
- Mann,Thorbjoern (1992)Building Economics for Architects. Wiley.

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PSO 2	PS O 3
CO1							3						3		
CO2								2					3		
CO3				3									3		
CO4												2	3		
CO5												2	3		
Avera ge				3			3	2				2	3		

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC54 THEORY OF ARCHITECTURE-I

Lectures/Week : 02	CIE Marks : 50
Credits: 02	SEE Marks : 50
Total Teaching Hours :28	Exam Hours: 03

Objective:

To acquaint the students with the basic aesthetic principles involved in architectural design and the grammar of architectural aesthetics.

MODULE:I	HRS
Definition of Art and role of Art in Society: Role and meaning of art, various types of arts:fine arts, performing arts, commercial arts, industrial arts, folk arts, abstract art, visual arts, spatial arts, temporal arts, pop art etc., relationship of architecture with other art like Painting and Sculpture. **Principles of Aesthetics and Architectural Composition :1 –** Unity, Balance, Proportion, Scale in Architectural composition. Illustrations and its application to the practice of design with historical as well as contemporary buildings.	6
MODULE:II	
Principles of Aesthetics and Architectural Composition :2: Contrast, harmony, accentuation, restraint in Architectural composition. Illustrations and its application to the practice of designing historical as well as contemporary building. **PrinciplesofAestheticsandArchitecturalComposition3:** Repose, vitality, strength in Architectural composition. Illustrations and its application to the practice of design in historical as well as contemporary building.	6
MODULE:III	
OrganizingprinciplesofAestheticsandArchitecturalComposition:1: Symmetry, asymmetry, hierarchy, datum, axis, rhythm in Aesthetics and Architectural Composition and its application to the practice of design. **Spatial organizations of Masses in Architecture :1:** Centralized and clustered; Illustrations of centralized and clustered massing in spatial organizations of masses in Architecture and its application to the practice of design with both historical as well as contemporary buildings.	6
MODULE:IV	
Spatial organizations of Masses in Architecture :2: linear, radial, grid organization. Illustrations of linear, radial, grid organization in spatial organizations of massesin Architecture and its application to the practice of design with both historical as well as contemporary buildings. **Ornamentation in Architecture:** Historical perspective of the use of ornament in buildings and use of ornament as a decoration to embellish parts of a building. Use and need of ornament in architectural design–different types of ornamentation in buildings.	6

Ornamentation in Architecture Criticism–Argument against ornamentation. Ideas of architect Adolf Loos (Ornament and Crime); Ornaments as economically inefficient and morally degenerate, reduction of ornament or lack of decoration as the sign of an advanced society.	
MODULE:V	
Materials, Materiality and Tectonics: Aesthetic and structural potentials in Architecture of materials like brick, timber, stone, concrete, glass. **Style in Architecture:** Basis for classification of styles including chronology of styles arrangement according to order that changes over time. Evolution of styles; reflecting the emergence of new ideas as reaction to earlier styles as a result of changing of fashions, beliefs, technology etc. **Perceptions in Architecture:** Experience of architecture in basic psychological and physiological terms. Way in which human minds and bodies respond to space, light, texture, color, and other architectural elements. (8hr:9hr)	4

References:

- Form, Space and Order"byFrancisDKChing
- Design Fundamentals in Architecture"byParmarVS
- Theory of Architecture byPaulAla Creating Architectural Theory by John Lang

Course outcome:

CO1	Identification of aesthetics principles and application of role of art in society.
CO2	Application of principles of aesthetics and composition
CO3	Comparing organizing and spatial organization; application in architecture.
CO4	Explain and apply ornamentation in architecture
CO5	Identification of materials, style and its application in architecture

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1						**3**							**3**		
CO2		2											3		
CO3		2											3		
CO4						3							3		
CO5		3											3		
AVERAGE		6				6							3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG55 STRUCTURE – V

Lectures/Week : 03	CIE Marks : 50
Credits: 03	SEE Marks : 50
Total Teaching Hours :42	Exam Hours: 03

Objective:
To provide an introduction to design of reinforced concrete structures.

Modules	Teaching hours
MODULE:I 1. Concrete: properties of fresh and hardened, Basics of mix design, water cement ratio, strength, Durability, workability requirements. Relevance of RCC in Architectural practice Advantages of RCC over other conventional structural practices. Steel for RCC – Plain & Twisted bars, IS 456 code provisions.	**8 Hours**
MODULE:II 2. Working Stress method of design – Basic concept, types of loads, assumptions, calculation of MR For singly RC beam (only).	**9 Hours**
MODULE:III 3 Necessity and philosophy of limit state design, Rectangular Beam Limit state design of simply supported slabs, Necessity and Philosophy of limit state design, Limit state design of singly and doubly reinforced and simply supported one way and two:way slabs. Use of SP 16, IS 456 permitted	**8 Hours**
MODULE:IV 4. Limit state design of columns (axial and uniaxial bending) and footing (axially loaded square footing)	**9 Hours**
MODULE:V 5. Design of Dog:legged and open well stairs (waist slab type)	**8 Hours**

Course outcome:

CO1	Identify the Basics concepts of concrete and RCC.
CO2	Determine the moment of resistance for singly RC beam using working stress method of design.
CO3	Design of beam and slab using limit state method of design.
CO4	Design of Column and Footing using limit state method of design.
CO5	Design of Dog:legged and open well Staircases.

Reference:

1. A. K. Jain "Limit State method of Design" Nemchand& Bro's, Roorkee
2. N Krishnaraju "Design of Reinforced Concrete structures" CBS Publishers
3. Shah &Karve "Limit state theory & design of Reinforced structures" structures publication Pune. 4. Park &Paulay "Reinforced Concrete" John wiley& son's
5. P. Purushothaman "Reinforced Concrete structural elements" Tata Mcgraw: Hill Publishers, New
Dehli.
6. BIS code – IS 456:2000

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2													3	
CO2				3										3	
CO3			3											3	
CO4			3											3	
CO5			3											3	
AVERAGE	2		3	3										3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC56 BUILDING SERVICES – II

Lectures/Week : 03	CIE Marks : 50
Credits: 03	SEE Marks : 50
Total Teaching Hours :42	Exam Hours: 03

Objective:
To make students understand, Mechanical services in building and follow the norms of NBC with their integration in Architectural design.

Outline:
To emphasize the knowledge of vertical Transportation, AC, Fire fighting system etc for Multistoried buildings

MODULE	TEACHING HOURS
MODULE–I **Air Conditioning:** Introduction, types of Air conditioning systems, Calculation of Air conditioning loads. Ducts, Duct systems. Air Outlets, Air conditioning methods and equipments. Residential and commercial air conditioning, energy conservation techniques, preparation of air conditioning layout.	**8 Hours**
MODULE–II **Elevators(Lifts):** Types of Elevators, Civil dimensions of hospital lift, goods lift and service lift, definitions and components, lift locations in building i.e grouping of lift building as per NBC Norms. Architects role for installations of Elevators	**8 Hours**
MODULE–III **Escalators:** Introduction and various components of escalators, types of escalators. Capacity, size, space and speed of Escalators. Types of Escalators: (Vertical/ Horizontal locations in buildings). Escalators vs Elevators	**8 Hours**
MODULE–IV **Fire:** Introduction, fire safety in buildings. Planning stage, brief description of Combustible and non combustible materials in case of fire, fire rating, fire escape routes, active fire control using portable extinguishers, basic concepts in fixed fire fighting installations, smoke alarm systems, wet riser, down composer, comparative analysis. Fire hydrants, yard hydrants, fire sump – placement, design.	**9 Hours**

MODULE–V • Artificial intelligent equipments used in Architectural fields Door sensors, sensor controlled lightings, GPS controlled equipments, sensor securities system, sensor plumbing fittings. • Solar system equipments used in Architecture and construction fields. • Solar water heater, photovoltaic cells for generation and equipments used for lighting.	**9Hours**

Assignment :

- Air conditioning layout for a small residence and only study of AC Layout in a large shopping complex and office complex
- Lift and Escalators : Study and design of Hospital lifts, Capsule Lifts, Finishes and precautions

Course outcome :

CO1	Application of the Air Conditioning systems for Residential and commercial buildings
CO2	Installation of different types of Elevators as per NBC Norms w.r.t Design consderations
CO3	Analyzing and Installing, Escalators and Elevators for various types of buildings
CO4	Prevention & safety fire fighting measures for fire safety of buildings
CO5	Applying Artificial intelligent equipments for buildings

Reference:

- " Principles of Refrigeration" by Roy J Dosat
- "Air Conditioning and Refrigeration Data Hand book"by Manohar Prasad
- "Refrigeration and Air Conditioning" by Don Kundwar
- *NBC Part

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3													3	
CO2		2												3	
CO3		3												3	
CO4		3												3	
CO5	3													3	
AVERAGE	3	4												3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC57 COMPUTER APPLICATIONS IN ARCHITECTURE – III

Studio/Week : 02	CIE Marks : 50
Credits: 02	SEE Viva Marks : 50
Total Teaching Hours :28	Exam Hours:

OBJECTIVE:

To develop required skills in preparation 3 dimensional drawing using computers.

SL	MODULE:I	HRS
1	**Introduction** To Sketch UP **Pro**: Importance of Sketch UP Pro for Architecture Students, Getting to Know the Interface, Interface basics, Adding toolbars, Navigating, Changing perspective, , Shading faces and edges, Setting preferences. **Manipulating Objects:** Selecting and moving objects, Scaling and rotating objects, Manipulating faces and edges, Advanced selection tools. **Drawing:** Line tool fundamentals, Refining objects with the Line tool, Using the Rectangle tool, Pushing and pulling faces into 3D,Creating circles and polygons, Creating arcs, Using the Offset tool to create outlines, Creating 3D text. **Measuring and Labeling:** Using the Tape Measure tool, Creating text labels, using the Dimension tool, Creating sections.	**6**
	MODULE:II	
2	**Organizing Scenes**: Grouping objects, Working with layers, Creating layers, Using the Outliner , Hiding and un hiding objects, Locking and unlocking objects **Creating Textures and Materials:** Using the Materials Browser on a Mac, Applying materials, Editing materials, Creating materials, Adjusting materials, Applying bitmap images, Mapping curved objects, Projecting maps on curved objects **Importing floor plans, Modeling with floor plans, Rendering .**	**6**
	MODULE:III	
3	**Introduction To Revit**: : Importance of Revit, Using Basic Building Components I**,** Using the Editing Tools**,** **Datum Planes and Creating Standard Views** : Working with Reference Planes , Working with Levels, Working with Grids ,Working with Project Views **Using Basic Building Components II :** Creating Floors :Creating Roofs – Shape Editing Tools : Creating Ceilings : Adding Rooms **Using Basic Building Components III:**Working with Components, Adding Stairs, Adding Railings and Ramps , Creating Curtain Walls	**6**
	MODULE:IV	
4	**Annotations and Dimensions**:Adding Tags ,Keynotes **Creating Project Details and Schedules**: Project Detailing, Adding Text	**6**

	Notes, Working with Schedules **Creating Drawing Sheets and Plotting:** Creating Drawing Sheets , Creating Duplicate Dependent Views	
	MODULE:V	
5	**Creating 2D drawing:** Working on plans, elevation and sections with Revit. **Creating 3D Views** :Three Dimensional Views **Rendering:** Working with Materials, and Rendering.	**4**

COURSE OUTCOME:

With the successful completion of the course student should have capability to:

- Apply basic Sketch UP Concepts to 2D Geometry shapes And Draw Walls, Doors, Windows, Stairs using Sketch UP Software.
- Apply 3D Modeling to convert 2D drawings into 3D Model using Sketch UP software.
- Apply basic Revit Concepts to Building Components And Draw Roofs, Ceilings, Stairs, Ramps using Revit software.
- Ability to prepare Annotations, Dimensions Project Details ,Schedules of a project .
- Perform photo realistic rendering of the building project Revit software.

SOFTWARE FOR REFERENCES

1. AutoCAD Student Version
2. Autodesk Revit
3. Sketch:Up
4. Paint 3D
5. 3D Max

REFERENCES: Pradeep Jain & A.P. Gautam, Engineering AutoCAD

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	2				3			3				3			
CO 2					3			3				3			3
CO 3					3			3				2			
CO 4	3				2			3				3			
CO 5					3			3				3			3
AV G	2.5				2.8			3				2.8			3

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG.

21ARC58 WORKING DRAWING

Lectures/Week : 01	CIE Marks :50
Studio / Week:02	SEE Viva Marks: 50
Credits: 02	Exam Hours:
Total Teaching Hours: 28	

Objective:
Introduction of working drawings and Details: Coordination between Architectural, Structural, Services and other disciplines, Preparation of Architectural Working Drawings for a design project.

MODULE	TEACHING HOURS
MODULE:I Conventional Method: Architectural Drafting – lettering, Dimensioning Line, Title Block, Office Standard. (Cad)	**8HRS**
MODULE:II frame Bearing Structure: Center line plan, Measuring Drawing , Foundation plan , Floor plan working plan showing the details of wall and openings, elevation, section, (cad Drafting)	**9HRS**
MODULE:III Site plan/Permission/Approval Drawing SOP, Schedule of opening (Door, window, grills) frame structure	**8HRS**
MODULE:IV frame Structure: detail measuring drawing of plumbing and Detail measuring drawing of electrical layout	**9HRS**
MODULE:V Detail drawing of kitchen or toilet Flooring Details, Sop, Schedule of opening (cad drawing)	**8HRS**

Portfolio:

- The above drawing need tp be prepaid for one design projection of Residence One set of drawing need to be prepaid on AUTOCAD for one design projection for mulity story framed structure.
- This enterer team work to be prepared for Vivo Examination.

Course Outcome (CO)

CO1	Identifying and applying different conventional method of architecture in practice
CO2	Prepare working drawing for frame bearing structures
CO3	Prepare detailed site, permission / approval drawing as per bylaws
CO4	Prepare detailed working drawing for frames structure
CO5	Prepare detailed working drawing for kitchen or toilet

Reference:

- Metric Architectural Construction, Drafting and Design fundamentals by William J Hornhung
- Working Drawings Hand Book by Keith Styles
- General Architectural Drawing by William E Wyatt.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	2				3			3				3			
CO 2					3			3				3			3
CO 3					3			3				2			
CO 4	3				2			3				3			
CO 5					3			3				3			3
AV G	2.5				2.8			3				2.8			3

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG.

ELECTIVE:A
21ARC591 CLIMATE RESPONSIVE DESIGN

Lectures/Week : 01	CIE Marks : 50
Studio /Week : 02	SEE Viva Marks : 50
Credits: 03	Exam Hours:
Total Teaching Hours :42	

OBJECTIVE:
To develop awareness and familiarity with climatic responsive design and its integration with Architectural design.

OUTLINE	TEACHING HOURS
• Introduction to Passive cooling: Application to passive techniques of cooling such as orientation of building in different latitude on earth surface. To apply the principles of Solar Passive Architecture to design buildings. • Types of planning :the implementation of climatic features used for particular climate. • Introduction to a design exercise (Project application): Design of surrounding Space by landscape to change the micro climate by water bodies and plantation. • Study and implementation: Use of advanced reflective material & color to control the heat propagation through building envelope. • Advance technique: Use advanced construction technique and materials used in building to bring down the temperature of indoor space. • Climatic components: Use of evaporative cooling, earth tunnels, roof pond, wind scope, and shaded courtyard etc.	42 Hrs

Note: Only one design exercise (in hot dry climate) with an objective to integrate passive cooling systems in the design. Study of local materials with respect to thermal cooling and construction Technique & Landscape

Reference:

- "Housing Climate and Comfort" by Martin Evans
- "Climate Responsive Architecture" by Arvind Kishan Baker and Szokolay
- "Energy efficient in India" by Mili Mujumdar

COURSE OUTCOME

With the successful completion of the course student should have capability to

CO1	Explain the introduction and various types.
CO2	Implement the ideas based on proposed site area.
CO3	Understand different material and color in climate responsive design.
CO4	Analyze the various construction equipment usage.
CO5	Prepare a of various components used in a building for climate.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	2				3			3				3			
CO 2					3			3				3			3
CO 3					3			3				2			
CO 4	3				2			3				3			
CO 5					3			3				3			3
AV G	2.5				2.8			3				2.8			3

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG.

21ARC592 VERNACULAR ARCHITECTURE

Lectures/Week : 03	CIE Marks : 50
Credits: 03	SEE Marks: 50
Total Teaching Hours :42	Exam Hours: 03

OBJECTIVE:
Study of Vernacular Architecture in India with respect to its local identity and culture.

MODULES	TEACHING HOURS
MODULE : I Introduction to the history, planning concepts, building construction techniques and materials of Vernacular Architecture.	8 Hrs
MODULE : II Study of factors affecting the designing and shaping the character of building with respect to the regional setting climatic condition, socio-economic and religious aspects.	8 Hrs
MODULE : III • Methods of documentation and analysis of Vernacular Architecture.	8 Hrs
MODULE : IV • Study of building typologies, street and settlement pattern and built fabric of selected region or area (Case Study).	9 Hrs
MODULE : V • Application of techniques and concepts in contemporary times through an illustration.	9 Hrs

COURSE OUTCOME:

CO1	Understand the concepts, selection of materials and construction techniques.
CO2	Identify the building design and character in various aspects of Vernacular Architecture.
CO3	Documenting and analyzing techniques.
CO4	Analyzing various aspects of built environment in given area of study
CO5	Application of Vernacular Architecture through an example.

References::

- Cooper, I Traditional buildings of India, Ilay.
- Paul Oliver [ED], Encyclopedia of Vernacular Architecture of the world, Volume 1, 2 & 3.
- Writings on Architecture and Identity, by B.V Doshi.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUT COMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO12	PSO1	PSO2	PSO3
CO1							3						3		
CO2	2		3										3		
CO3		3		3		2							3		
CO4				3	2				3	3			3		
CO5			3				3					3	3		
AVERAGE	2	3	3	3	2	2	3		3	3			3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

SYLLABUS CONTENTS OF VI SEMESTER B.ARCH
21ARC61 ARCHITECTURAL DESIGN – VI

Lectures/Week : 01	CIE Marks : 50
Studio / Week:05	SEE Viva Marks: 50
Credits: 06	Exam Hours:
Total Teaching Hours:84	

OBJECTIVES:

- To understand the differences and similarities of institutional goals and architectural goals.
- To understand the role of built environments.
- Projects shall be of urban scale with multiple functions based on considering building services such as water supply and sanitation, plumbing, vertical transportation, air conditioning, firefighting, security system, electrical data caballing, hospital services such as humidifier, exhausts, gas lines, bio waste and pharmaceutical waste etc.
- To understand the need for creating architecture as an envelope to system dependent program (various building services as a system).

OUTLINE	TEACHING HOURS
Various utilities, which remain invisible in most of the buildings, become visible and important in certain categories of buildings. Architecture in such buildings remains at the level of envelopes. Buildings of such nature shall be identified and studied. Projects like hospitals, IT buildings industries, sports complex; pharmaceutical company, milk dairy (medium scale) or three- star hotels where services and technology play important role may be considered. **STUDIO PROJECT:** studio project shall be attempted with utilities and service dominant buildings like pharmaceutical manufacturing units or medical facilities. Consultants in the field of utilities and services shall be called as part of studio review. **SUBMISSION:** One major project and a time problem to be dealt in the semester. Detailing of architectural features of the major project has to be attempted. • Study of service and technology as main feature in design • Study of structural system adopted, influence of Climatic, Environmental and ecological factors. • Case study, data collection, literature survey, detailing of architectural features involved shall be attempted. NOTE – CASE STUDY TO BE CONDUCTED COMPULSORY	84 Hrs

COURSE OUTCOME –
After completion of the course, a student will be able to:

CO1	Apply the built environment's role at planning and designing work.
CO2	Implement building services and waste management at large projects.
CO3	Prepare drawings considering external and internal factors like site approach, traffic, ecology, Size, volume, levels, functional spaces or zones, structural possibilities.
CO4	Design the project by implementing the constraints like architectural bye – laws, budget, ideology etc.Create Architecture as an envelope to system dependent program.
CO5	Apply environmental and ecological factors and influence of climate at built environment

- .

REFERNCES–

1) RogerH.ClarkandMichaelPause,"Precedentsinarchitecture",1984,JohnWiley&Sons.
2) GeoffreyHBaker,"LeCorbusierananalysisofform",1996,VanNostrandReinhold.
3) HermanHertzberger,"Lessonsforstudentsinarchitecture",1991,DelftUniversity.
4) Charles Correa,"Aplaceinshade",2010,PenguinIndia
5) RemKoolhaas,"Conversationwithstudents",1996, Princeton Architectural Press

MAPPING OF Course Outcomes, Program Outcomes and Program Specific Outcomes.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			3	3	3							2	3	3	
CO2						3	3					2	3		
CO3			3		3							2	3		
CO4	1		3												
CO5			3				3								
AVG	1		3	3	3	3	3					2	3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC62 BUILDING CONSTRUCTION- VI

Lectures/Week : 01	CIE Marks : 50
Studio / Week:03	SEE Viva Marks: 50
Credits:04	Exam Hours:
Total Teaching Hours:56	

Objective:

- To Study the construction systems of roofing for large span and complex buildings

Modules	Teaching hours
MODULE I Steel trusses for various spans, ridge truss, saw tooth truss with lattice girders, roof lightings, Asbestos sheet.	**9 Hrs**
MODULE II Poly carbonate sheet, FRP Sheet and Profiled MS Sheet cladding and roof fixing details, Structural Glazing.	**8 Hrs**
MODULE III Roofs–Shell Roof Folded Plate, Geodesic Domes, Space Frame.	**9 Hrs**
MODULE IV Tensile Structures, Pneumatic structures, pre-engineering metal buildings.	**8 Hrs**
MODULE V Self–Supporting steel roofing, Flat Slab, waffle Slab, Coffer Slab.	**8 Hrs**

Submission:

Minimum one plate on each construction topic. Site visits to be arranged by studio teachers. The Entire portfolio on Construction shall be presented for termwork.

Course outcome:

CO1	Recognize different types of steel trusses & implement them as per local conditions
CO2	Identify different types of roofing sheets, cladding materials & its application suitable to different building types
CO3	Identify different pre:engineered buildings such as shell roof, folded plates, geodesic domes, space frames & its utilization as per suitability
CO4	Analyze different self supporting & advanced structures such as tensile structures, pneumatic structures & pre:engineered metal buildings
CO5	Application of different types of flat slabs

Reference:

- Various Prefab corporation websites.
- Central Buildin Research Institute Web Material.
- Building Construction by W.B.Mackay
- Construction Technology by Chudley
- ConstructionofBuilding by Barry
- BuildingConstruction by Rangawala
- BuildingConstruction by Punmiya

CO PO Mapping:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO 2**	**PSO 3**
CO1		2												3	
CO2		3												3	
CO3		3												3	
CO4		3												3	
CO5	3													3	
Average	3	2.5												3	

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC63 PHYSICAL PLANNING- I

Lectures/Week : 03	CIE Marks : 50
Studio / Week:0	SEE Marks: 50
Credits:03	Exam Hours:03
Total Teaching Hours:42	

Objective:
To give an introduction to the discipline of urban and regional planning

MODULE	TEACHING HOURS
MODULE –I Human settlements – Urban settlements and rural settlements, differences, origins, evolution and growth of settlements. Major functions of a city, city forming and city serving functions. Problems faced by a typical city. Relation between urban and rural settlements, characteristics and planning efforts of cities and towns of various historical periods like Egyptian, Greek, Roman, Medieval, Renaissance, Neoclassical. Industrial Revolution and its impact on cities, the contemporary city. Cities of Indus valley and Vedic period, cities of Moghul period and British period, typical Indo-Aryan cities, typical Dravidian temple city. (To be dealt in brief)	**9 Hrs**
MODULE –II Planning Theories – enunciated by Ebenezer Howard, Patrick Geddes, Soria Y Mata, Dioxides, LeCorbusier, Clarence Stein , Clarence Arthur Perry, Hilberseimer , Jane Jacobs – their relevance to Indian Conditions.	**8 Hrs**
MODULE –III Land use planning, land use classification for cities and rural settlements, analysis of land uses in Indian cities. Urbanization, Industrialization and urban growth, definitions and inter relationship. Trends in urbanization in India since Independence. Growth of metropolitan cities, their growth and management problems, world urbanization trends.	**9 Hrs**
MODULE –IV Components of a settlement – activity pattern and land use, traffic and road network, density of Population and population distribution. Central business district of a city, other business districts, Urban nodes, rest of the city, fringe area and suburbs. Growth and aging of	**8Hrs**

various parts of the city Particularly the CBD the problems caused due to this including slums, internal spatial structure of Cities – concentric zone theory, sector theory, multiple nuclei concept and work: home concept.	
MODULE: V Planning Techniques – study and analysis of existing settlements, methodology of conducting diagnostic surveys and studies, land use survey, density survey, FSI survey, traffic surveys, presentation of data Regional Planning – relation among various settlements of a region, pattern of settlements in a region. Definition of a region, various types of regions, basic principles of regional planning Urban Redevelopment, Renewal, Rehabilitation and Conservation	**8 Hrs**

Course Outcome (CO)

CO1	Identifying different types of settlement
CO2	Application of various theories for efficient physical planning
CO3	classify land use for cities and settlement
CO4	Identifying the component of settlement and applying the theories of cities (CBZ section theories
CO5	conduct survey as per principle techniques and principle of regional planning

References:

1) Simon Eisner, Arthur Gallion& Stanley Eisner, Urban Pattern, VNR, New York, 1993
2) Clara Greed, Introducing Town Planning, Longman, Scientific and Technical, Harlow, 1973

21ARC64 THEORY OF ARCHITECTURE – II

Lectures/Week : 02	CIE Marks : 50
Credits:02	SEE Marks: 50
Total Teaching Hours:28	Exam Hours:03

Objective:

To acquaint the students with architectural theory from antiquity to the present and

MODULE:I	HRS
Introduction to Theory in Antiquity: Marcus Vitruvius and his multi:volume work entitled De Architecture. Maya Mata: Indian Treat is on Housing &Architecture **Introduction to Theory in Renaissance:** Leon Alberti, Andrea Palladio – Jacques Francois Blondel and Claude Perrault of French Academic Tradition. **18th Century Theory**: Ideas of Laugier, Boullee,Ledoux **19thCenturyTheory:**Concepts of Viollet Le Duc,John Ruskin,Quatramerede Quincy and Gottfried Semper	6 Hrs
MODULE:II	
Modern Movement Theory: Ideas of Adolf Loos, Eero Saarinen, Erich Mendelsohn, Richard Neutra,OttoWagner,KenzoTange. **Post Modern Theory:1:** Ideas on Post:Modern Classicism by Robert Venturi and CharlesJencks.Deconstruction: Fundamental beliefs and philosophy and ideas of Peter Eisenman.	6Hrs
MODULE:III	
Post Modern Theory:2: Contribution to architectural thought: Ideas of Kenneth Frampton and Christopher Alexander **PostModernTheory:3:**Contributiont Of architectural thought :Ideas of Amost Rapoport, Geoffrey Broad bent:his design generation theories.	6 Hrs
MODULE:IV	
Architectural Criticism: Definition & Sources, to examine fundamental questions of what Architectural criticism actually is, its role and function in architecture and the relationship between criticism and judgment. Specifically in terms of, thinking, discussing, and writing on architecture, social or aesthetic issues. Positive and Normative theories of JonLang., **Architectural Criticism types:** Definition, Sources, Types of Criticism according to WayneAttoe	6Hrs
MODULE:V	
Design Logic: Design generation process: Role of logic and intuition in concept generation. Step by step development of design from problem definition, site analysis to post occupancy evaluation as the last stage of design. **Contemporary Significant Theory:** Ideas of Hassan Fathy who pioneered the use of appropriate technology for building in Egypt, especially by working store:establish the use of mud brick (or adobe) and tradition as opposed to western building designs and layouts and Paolo Soleri's concept of	4 Hrs

"Arcology", architecture coherent with ecology. Shape of built environment to come. Floating, walking, plug:in, satellite settlements, earth sheltered etc.Works of Archigram, Paolo Soleri, KenzoTange, MosheSafdie etc.	

References:

- Broadbent,Geoffrey.DesigninArchitecture,JohnWiley&SonsLtd,1977
- Lang,Jon,CreatingArchitecturalTheory,VanNostrandReinholdCo,NewYork1987
- "Amomentin Architecture" and Other Books by Gautam Bhatia.

Course outcome:

CO1	Application of theory in antiquity for housing and architecture
CO2	Identify and apply renaissance theory in architecture.
CO3	Explain postmodern theory 1 & 3 and apply concept of architectural thought.
CO4	Apply fundamental architectural critism
CO5	Identify design logic and apply contemporary significant theory.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO 3**
CO1	1												**3**		
CO2	2												3		
CO3	2												3		
CO4						3							3		
CO5	2												3		
AVERAGE	2.6					3							3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG65 – STRUCTURES –VI

Lectures/Week : 03	CIE Marks : 50
Credits:03	SEE Marks: 50
Total Teaching Hours:42	Exam Hours:03

Objective:

Introduction to the design of steel structures (with ref to IS 800: 2007 Limit state method) and prestressed concrete

Modules	Teaching hours
MODULE:I • Advantages & disadvantages of steel structures. Different structural steel forms load and Load combination (limit state method of design) Design of simple and eccentric bolted connections bearing type & HSFG bolts.	**8 Hours**
MODULE:II 2. Welded connection: Advantage &disadvantage. Types of welds. Design of simple weld connections Design of Structure tension members	**9 Hours**
MODULE:III 3. Design of compression members: design of angle struts design of column of lacing (single & double)	**8 Hours**
MODULE:IV 4. Basic concept of pre:stressed concrete, PSC materials advantage and disadvantage pre:stressed concrete member pre:stressing system. Problems on analysis and losses in pre:stressed concrete and estimation of total losses (simple problems on estimation of losses)	**9 Hours**
MODULE:V 5. Basic concept of shell advantages and disadvantages classified of shells. Structural concept and detailing in shell structure folded plate behavior. Structural concept and detailing in folded plate behavior of flat slab advantages and disadvantages and typical detailing in flat slab. Behavior of grid slab and structural detailing in grid slab.	**8 Hours**

Note: the teacher is also expected to expound the structural concepts introduced in non–mathematical terms with examples and application in architectural design and Site Visits (Minimum 4nos.)

Course outcome:

CO1	Design of bolted connection and basic concepts of structural steel.
CO2	Design of tension members.
CO3	Design of compression members.
CO4	Basic Concept of prestressed concrete and the losses of prestress.
CO5	Basic concepts of shell, folded plates, flat slab, and grid slab.

Reference:

1."Design of Steel Structures" by Ramachandra (by Limit state method)
2."Design of Steel Structures" BY Kazimi and Jindal (by Limit state method)
3."Design of steel structures" By L. S. Negi
4."Design of steel structures by Subramanian
5."Design of steel structures by Duggal

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PSO1**	**PSO2**	**PSO3**
CO1			3											3	
CO2			3											3	
CO3			3											3	
CO4	2													3	
CO5	2													3	
AVERAGE	2		3											3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC66 PROFESSIONAL PRACTICE –I

Lectures/Week : 03	CIE Marks : 50
Credits:03	SEE Marks: 50
Total Teaching Hours:42	Exam Hours:03

Objective:

- To understand the responsibility and liabilities of the profession.
- To understand the process of Contract management

Modules	Teaching hours
MODULE:I **Profession:** Idea of profession; differences between profession, trade and business. **Profession of architecture:**Types and extent of services offered by architects, scale of fees, stages ofpayment, and contract between client and architect. **Code of Professional Conduct:**Architects Act of 1972, role of Council of Architecture, Indian Institute ofArchitects in functioning of the Profession.	**8 Hrs**
MODULE:II **Practice:** Types of Architectural firms, proprietorship, partnership, associate ship and private limited firms advantages and disadvantages of each type of firm; building clientele and projects. **Architectural competitions:** guidelines of COA, procedure of conduct of competitions. **Office Management:** Administration of Architectural firms; basic accounting procedures.	**8 Hrs**
MODULE:III **Tender:**Tender document and its content. Types of tenders, advantages and disadvantages of each type; suitability to various projects. Tender notices, opening, scrutiny, process of selection and award. Architect's role in tender process. Earnest Money Deposit, Security Deposit, Retention Amount, MobilizationAmount and Bonus & Penalty Clauses. Issues arising out of tendering process and the role of an architect.	**9 Hrs**
MODULE:IV **Contract:** General Principles, types of contracts; Contract document. Contract Management: Architect's role in Contract Management. Conditions and Scope of Contract; role of an architect in ensuring completion of contract. Issues arising in Contract: i) Termination of contract, ii) Certificates of value and quality, iii) Virtual completion and final completion, iv) Defects liability period, v) Latent and patent defects, vi) Liquidated and unliquadated :liquidated damages, vii) Extension of time, delays and	**9 Hrs**

penalty, viii) Non tendered items, extras, extra work, additional works, variations, rate analysis and architect's role in certification of variations, ix) Prime cost, provisional sum.	
MODULE:IV **Byelaws:** Building byelaws, National Building Code, floor area ratio, floor space index, floating FAR, zoning regulations. Overview of Master Plan/CDP of relevant cities.	**8 Hrs**

References:

Namavathi, Roshan, Professional Practice for Architects and Engineers, Lakhani Book, New Delhi, 2001.
Krishnamurthy K G and Ravindra S V, Professional Practice, S V Ravindra, 2009,Bangalore

COURSE OUTCOME:

CO1	**CO1:** Differentiate between the Idea of Profession and business.
CO2	**CO2:**Understand about the different architectural firms and about the various competition.
CO3	**CO3:** Explain the Tender with the role of Architect.
CO4	**CO4:** Analyze the various contract with the role of Architect.
CO5	**CO5:** Understand the byelaws with the overview of Master plan with relevant cities.

CO PO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1						1		2		1			3		
CO2		2				1	2	2		1			3		
CO3						1	2	2		1		3	3		
CO4						1	2	2		1		3	3		
CO5						1		2		1		3	1		
Avg.		2				1	2	2		1		3	1		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC67 BUILDING ACOUSTICS

Lectures/Week : 03	CIE Marks : 50
Credits:03	SEE Marks: 50
Total Teaching Hours:42	Exam Hours:03

Objective:

- To develop the knowledge and skills required for understanding acoustics in buildings at its integration with architectural design.
- To explore the role and capacity of sound in all its variations and to enhance the comfort of built form .

MODULES	TEACHING HOURS
MODULE:I Introduction to the study of acoustics – nature of sound, basic terminology – frequency, pitch tone, sound pressure, sound intensity, decibel scale, loudness, threshold of audibility and pain, masking, sound distance – inverse square law.	8 Hrs
MODULE:II Behavior of sound in enclosed spaces – reflection of sound, nature of reflection from plane, convex and concave surfaces, sound diffraction, absorption of sound, sound absorption coefficient, reverberation, reverberation time calculation, use of Sabine's and Eyring's formulae, sound absorbents, porous materials, panel or membrane absorbers and cavity or Humboldt resonators, role of functional absorbers. Absorption coefficient of indigenous acoustical materials, method of setting out of raked seating.	8 Hrs
MODULE:III Acoustical design requirement for halls used for speech, drama and music – general purpose halls used for both speech and music, cinema theatres, open air theatres. Study of auditoria designed and acoustically treated.	8 Hrs
MODULE:IV Introduction to environmental noise control, noise and its classification, outdoor and indoor noise, airborne noise and structure borne, impact noise, community and industrial noise. Transmission of noise and transmission loss. Maximum acceptable noise levels, .Means of noise control and sound insulations. Constructional measures of noise control and sound insulation.	9 Hrs

MODULE:V Use of Sound measuring instrument. Sources of industrial noise – impact, friction, reciprocation, air turbulence and other noise. Methods of reduction by enclosures and barriers, sources of outdoor noise – air traffic, rail traffic, road traffic and seashore and inland. Traffic planning and design against outdoor noise for air traffic, road traffic and rail traffic.	9Hrs

Assignment

Design of a small auditorium for a capacity up to 200 persons

- Speech
- Dance & Drama plus multipurpose hall
- Film theater
- Design & draft plans, sections, and acoustical details at least any two of the above
- Noise attenuation technique inside and outside with examples and sketches
- Submission of portfolios with material finishes and samples.

Course outcome :

CO1	Classify the properties and principles of Sound waves,
CO2	Analyze behavior of sound in different enclosed spaces and various materials
CO3	Identify acoustical design requirements and apply in construction.
CO4	Analyze different noise sources , noise control and insulation.
CO5	Analyze noise classification and barrier in different zones

Reference:

"Environmental Acoustic" by Leslie L Doelle
"Acoustical Designing in Architecture" by Knudson, Vern
"Acoustics: Noise and building" by Parich Peter,
Architectural Acoustics" by David Egan.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3													3	
CO2		3												3	
CO3			3											3	
CO4		3												3	
CO5			3											3	
AVG	3	3	3											3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

ELECTIVE – B
21ARC681 HOUSING

Lectures/Week : 03	CIE Marks : 50
Credits:03	SEE Marks: 50
Total Teaching Hours:42	Exam Hours:03

OBJECTIVE:
To introduce to the scenario of housing in India. To understand the development of housing sector in India Context with various factors defining its architecture.

MODULE	TEACHING HOURS
Module – I Definition of Housing & House. Problems of housing in India context, housing & its relationship with town & neighborhood, housing typology.	8 hours
Module – II Housing standards, derivation, approval of existing standards & design criteria for different Socio economic group.	**8 hours**
Module – III National housing policy, housing program at national and local level. Role of public & private institutions (Like HUDCO, LIC, National Housing Bank, Housing Boards, Housing Infrastructure Boards etc.) in solving the housing problems. National Urban and Rural Housing and Habitat Policies.	**8 hours**
Module : IV Site planning selection of site for housing, mass housing, Housing Density and impact on Cities, slums, squatter settlements problems & possibilities, :CPTED (crime prevention through environmental design) concept in housing: Defensible Spaces, Idea of Neighborhood (by Clarence Stein and Perry), Introduction to RERA (Real Estate Regulatory Authority).	**9 hours**
Module – V Study of some of the examples of houses with cost effective, socially interactive, safe and architecturally unique Design solutions for a housing problem at local and National level.	**9 hours**

Assignment: Module wise Assignments need to be given after completion of each module and to be evaluated immediately.

COURSE OUTCOME:

CO1	Applying various aspects of Housing and city development strategies in India.
CO2	Implementing Housing standards in planning process.
CO3	Implementing Housing policies at various levels.
CO4	Implementing various aspects of housing in design process.
CO5	Applying cost effective techniques in various aspects.

References:

- Housing & Urbanization – Charles Correa
- Housing & Economic Development in Indian county: Challenges & opportunity – By Robinleichenko
- Housing/ national portal of India.
- Urban Development & Housing in India – 1947 to 2007 – By Rishimuni Dived

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUT COMES	**PO 1**	**PO 2**	**PO 3**	***PO 4***	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO12**	**PSO 1**	**PSO 2**	**PSO 3**
CO1			3	*3*	3							2	3		
CO2						3	3					2	3		
CO3			3		3							2	3		
CO4	1		3										3		
CO5			3				3				3		3		
AVERAGE	1		3	*3*	3	3	3				3	2	3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

ELECTIVE – B
21ARC682 ARCHITECTURAL CONSERVATION

Lectures/Week : 02	CIE Marks : 50
Studio/ Week:01	SEE Marks: 50
Credits:03	Exam Hours:03
Total Teaching Hours:42	

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	TEACHING HOURS
MODULE –I • 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.	**8 HRS**
MODULE –II • Causes of defects and decay of a heritage structure. • Natural agents of deterioration and loss.	**8 HRS**
MODULE –III • 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.	**8 HRS**

• 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 –IV 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).	**9 HRS**
MODULE –V 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.	**9 HRS**

Note:
A consolidated portfolio containing exercises related to each of above topics are to be submitted for term work examination.

Outline:
At the end of the semester, the students will understand about conservation and preservation technique.

Reference:

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

COURSE OUTCOME

CO1	Understand the basics of heritage and conservation.
CO2	Study about the deterioration of historical buildings.
CO3	Understand the process of preservation and conservation.
CO4	Understanding various policies in preserving/conserving the historical monuments.
CO5	Understand the ASI policies.

CO PO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO 1				2											3
CO 2				2		1									3
CO 3				2			1								3
CO 4				2		1	2		1						3
CO 5				1		1									3
AVG				2		1	1		1						3

CONTRIBUTION; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

IV YEAR SYLLABUS
B.ARCH

21ARC71 ARCHITECTURAL DESIGN - VII

Lectures/Week:01	CIE Marks:50
Studio/Week: 08	SEE Viva Marks :50
Credits :9	Exam Hours: :
Total Teaching Hours : 126	

OBJECTIVES:

- To gain knowledge about reading and documenting urban contexts and to understand the idea of urban space. To understand the difference between urban designs as opposed to urban development.
- To understand the role of architecture in shaping urban fabric.
- To develop architectural design which fits into a specific urban context.
- To understand the needs of privacy, community spaces, efficiency of open spaces and idea of extended living areas
- To understand the structural feasibility of buildings for various forms
- To differentiate and understand the nature of organic and planned communities.

OUTLINE	TEACHING HOURS
1. Studio projects shall be based on considering the principals involved in community architecture 2. Studio projects shall be based on sustainable architecture and energy efficient buildings, reuse recycled and recharging resources such as water, solar bio:resources, The role of urban space as a public realm needs to create such spaces as extension of private domain. The public building shall be investigated and shall become one of the architectural goals of the project. Some of the prerequisites of the project shall be; 1. Multiple functions. 2. Public access to majority of the space, 3. Large: gathering areas, which are open and extendable to the immediate urban context 4. Analyzing structural feasibility of the project to adopt various structural systems for spanning.	**126 Hrs**

Studio Project

High: rise building Projects like transport interchanges, large retail areas with entertainment areas, transport terminals with commercial areas, performing art center with museums and such multiple functions shall be taken. Study part of the studio shall be documented and shall review as part of the viva.

Eg of projects: Large group housing with other amenities, large retail areas with entertainment areas, Bus Terminal, Sports terminals, Community areas etc.

The design shall be sensitive to the needs of disabled, aged people and children.

Submission :

One major project and one mini project as time problem to be tackled in the semester. Detailing of architectural features of the major project has to be attempted

- Study of sustainable as a concept adopted in design
- Study of structural system adopted, influence of Climatic, Environmental and ecological factors, harvesting solar energy.
- Case study, data collection, literature survey
- Design proposal including block model
- Detailing of architectural features involved shall be attempted.

COURSE OUTCOME:

CO1	CO1: formulate multifunctional building with sustainability concepts in urban context
CO2	CO2: demonstrate knowledge of building services, climatic design, Environmental and ecological factors in built form
CO3	CO3: Analyze structural feasibility of the project to adopt various structural systems for large scale spanning.
CO4	CO4: utilization of energy efficient techniques, reuse recycled and recharging resources such as water, solar bio:resources
CO5	CO5: examine building orientation, public access, Large:gathering areas, which are open and extendable to the immediate urban context

CO PO Mapping:

	PO 1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1		3											3		
CO2			3										3		
CO3		3											3		
CO4					3								3		
CO5				3									3		
Average		3	3	3	3								3		

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC72 BUILDING CONSTRUCTION -VII

Lectures/Week :01	CIE Marks:50
Studio/Week : 03	SEE Marks (VIVA):50
Credits :4	Exam Hours: :
Total Teaching Hours : 56	

Objectives:
Building techniques with emphasis on applied constructional details and prefabricated construction , long spans and earth quake resistant techniques,

MODULE	TEACHING HOURS
MODULE:I Pre stressed and Post Tension Technology. Various Building components developed by CBRI. Various structural systems. Suitable for long span structures.	**12 Hrs**
MODULE:II Multi Basement construction with structural, lighting, ventilation, rain water disposal details. Various structural systems suitable for High Rise Structures. Wind pressure, shear wall and various other issues.	**12 Hrs**
MODULE:III Earth quake resistance detailing. Curtain wall construction.	**12 Hrs**
MODULE:IV Pre Engineered Building system. Factory Building using precast and prefabricated concrete elements.	**10 Hrs**
MODULE:V New trends in industrial buildings, spanning, roofing, lighting, ventilation etc. Architectural detailing of any one structure, such as a. Stadium. b .Tensile structure c. Multiplex, d. Cinema Theatre/Cultural center, e. Civic Center. f. Green roof construction.	**10Hrs**

Course outcome :

CO1	Understand the large span , pre stressed / post tensioned structure along with components developed by CBRI
CO2	Recognize multilevel basement construction and various structural system for high rise structures and its components,
CO3	Identify different earth quake resistance components and its application along with curtain walls

CO4	Identify different pre engineered structural elements in construction as per the design requirement
CO5	Distinguish different advanced roofing , lighting and ventilation systems in different building types and its application in construction

Reference books:

- Elements of Structures by MORGAN
- Structures in Architecture by SALVADORI
- Building Construction by MACKAY WB. Vol. 1 to 4
- Construction of Building by BARRY Vol. 1 to 5
- Construction Technology by CHUDLEY R. Vol. 1 to 6
- Building Construction illustrated by CHING FRANCIS D. K.
- Elementary Building Construction by MITCHELL
- Structure and Fabric by EVERET

CO PO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1			3											3	
CO 2		3												3	
CO 3		3												3	
CO 4		3												3	
CO 5		3												3	
AV G		3	3											3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC73 PHYSICAL PLANNING - II

Lectures/Week :01	CIE Marks:50
Studio/Week : 02	SEE Viva Marks 50
Credits :3	Exam Hours: :
Total Teaching Hours : 42	

MODULE	TEACHING HOURS
MODULE:I Urbanization industrialization & urban growth. Definitions & inter relationship trends in Urbanization in India since independence. Growth of metropolitan cities, their growth of management problems. world Urbanization trends. Human settlements: Urban settlements and rural settlements, differences. origins, evolution and growth of settlements, characteristics, Relation between urban and rural settlements.planning efforts or cities and towns or various historicalperiods like Egyptian, Greek, roman, Medieval, Renaissance. Neo:classical. cities or Indus valley and Vedic period. cities of Moghul period and British period. typical lndoAryan cities. typical Dravidian temple city. (To be dealt inbrief)	9HRS
MODULE:II Planning Theories : Theories by Ebenezer Howard. Patrick Geddes, Soria Y Mata, Dioxides, Le Corbusier, Clarence Stein, Clarence Arthur Perry. Hilberseimerpresent in India & Abroad their relevance to Indian conditions.	8HRS
MODULE:III Components of a settlement : Activity pattern and land use, traffic and road network, density of population and population distribution. Central business district of a city, other business districts, urban nodes, rest of the city, fringe area and suburbs. Growth and aging of various parts of the city. Particularly the CBD the problems caused due to this including slums, internal spatial structure of cities : concentric zone theory, sector theory, multiple nuclei concept and work : home concept.	8HRS

MODULE : IV Planning Tools& Techniques : Study and analysis of existing settlements, methodology of conducting diagnostic surveys and studies, land use survey, density survey FSI survey, traffic surveys. presentation of data. Introduction to GIS (local for Geographical information) Analytical Methods: • Classification of Regions, delineation of various regions. • Threshold Analysis,input output analysis SWOTanalysis. • Methods of population forecasts &projections. • Lorenz Curie, Ginny Ratio, theils Index. Ratios : Urban: rural, Urban Concentration & Metropolitan Concentration.	9HRS
MODULE : V Planning Standards: Spatial standards, performance standards & bench Marks URDPFI guidelines, zoning regulation & development controls. Regional planning: Relation among various settlements & pattern. Definition or a region, various types of regions. Basic principles of regional planning.	8HRS

Course Outcome (CO)

CO1	Identifying urbanization, industrialization, urban growth and human settlement
CO2	Apply the various theories of planning
CO3	Identifying the components of settlement & development to collect the information of central business district of city , other business districts ,urban node & growth of various parts of city
CO4	Collect spatial and non special data and apply for planning
CO5	Apply bylaw for planning and land development

References:

1) Simon Eisner, Arthur Gallion& Stanley Eisner, Urban Pattern, VNR, New York, 1993
2) Clara Greed, Introducing Town Planning, Longman, Scientific and Technical, Harlow, 197

CO PO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	P0 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1			3											3	
CO 2		3												3	
CO 3		3												3	
CO 4		3												3	
CO 5		3												3	
AV G		3	3											3	

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC74 URBAN DESIGN

Lectures/Week :01	CIE Marks:50
Studio/Week : 02	SEE Marks :50
Credits :3	Exam Hours: : 03
Total Teaching Hours :42	

OBJECTIVES:

- To understand the scope and nature of urban design as a discipline
- To introduce the component of a city and their interdependent
- To learn to interpret the city in different ways and layers
- To create awareness of contemporary urban issues as well as learn about possible Ways to address them

MODULE	TEACHING HOURS
MODULE : I INTRODUCTION TO URBAN DESIGN Components of urban space and their interdependencies : Outline of issues/aspects of urban space and articulation of need for urban design : Scope and objectives of urban design as a discipline	8 Hrs
MODULE : II ISSUES OF URBAN SPACE Understanding and interpreting of urban problems/issues: place making and identity, morphology; sprawl, generic form, incoherence, privatized public realm : effects/ role of real estate, transportation, zoning, globalization : ideas of sustainability, heritage, conservation and renewal contemporary approaches : idea of urban catalyst, transit metropolis, community participation : studio exercise involving the above	8 Hrs
MODULE : III BEST PRACTICE IN URBAN DESIGN Contemporary case studies from developing and developed economies that offer design guidelines and solutions to address various issues/aspects of urban space : case studies URBAN DESIGN FRAMEWORK • Formulating the vision of the place • Formulation of Objectives • Development strategy • Policy and development framework • Bench mark study and presentation by each group	9 Hrs
MODULE : IV Working as a studio group, you will transform community issues and objectives into a unified vision for the neighborhood with a series of strategies and an urban design framework. The urban design framework will establish a future vision of the corridors, districts and neighborhoods of the community. The framework will	9 Hrs

establish significant places for public investment as well as important civic design features of private development URBAN DESIGN PROJECT	
MODULE : V This unit will involve reading task on the new urbanism followed by class room discussions Once the overall vision for the place has been formulated and development objective are chalked out the group disperses. Each individual design will zoon in to their respective area of intervention for: • Project identification • Formulation of design program • Urban Design Project framework • Formulation of area • Design Development • Draft Proposal • Final Project	8 Hrs

COURSE OUTCOMES

CO1	Applying various urban design terminologies.
CO2	Identifying the various issues of Urban space
CO3	Formulating various urban design frameworks.
CO4	Analysing various urban design aspects of built environment in given area of study.
CO5	Implementing the learning in a systematic way while working on an urban level project.

Reference Books::

- Alexander Christopher : Urban Pattern
- Alexander Christopher : New theory of Urban Design
- Alexander Christopher : City is not a Tree
- Lynch Kevin : City Sense
- Lynch Kevin : Image of City
- DETR and CABE (2000) By Design : Urban Design in the planning System : Towards Better Practice
- DETR (2000) Planning policy Guidance Note 3 : Housing
- Krieger, A (Ed) (1991) Towns and Town Making Principles, New York, Rizzoli
- Tibbalds, F (1992) Making people Friendly Towns, Longman
- Urban Villages Group (1992 and 1998) Urban Villages
- English Partnerships/ Urban villages Forum (1998) Making Places

- Housing Corporation (1998) Scheme Development Standards
- Housing Corporation/DETR (1999) Housing Quality Indicators.
-

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUT COMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			3	3	3							2	3		
CO2						3	3					2	3		
CO3			3		3							2	3		
CO4	1		3										3		
CO5			3				3						3		
AVERAGE	1		3	3	3	3	3					2	3		

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG75 STRUCTURE : VII

Lectures/Week :03	CIE Marks:50
Studio/Week :00	SEE Marks :50
Credits :3	Exam Hours: : 03
Total Teaching Hours : 42	

Objective:
Introduction to special and advanced structural systems and structural forms. Detailing of RCC & steel structural members.

MODULES	Teaching hours
MODULE:I 1. Structural detailing of various foundations 2. Typical structural detailing's in RCC staircases (doglegged stairs, spiral stairs, cantilever)	8 Hours
MODULE:II 3. Typical structural detailing's RCC beam to beam connections and beam to column connections. Structural detailing of one way & two slabs (simple supported)	9 Hours
MODULE:III 4. Typical structural detailing's of steel: beam to beam and beam to column connections. (Framed, Seated connections) 5. Basic structural concepts of space frame, tensile structures pneumatic structures advanced structural systems high rise buildings.	8 Hours
MODULE:IV 6. Typical structural detailing drawing of Domes, shells, and folded plates 7. structural detailing of RCC flat slab and grid slab	9 Hours
MODULE:V 8. Introduction to lateral load, resisting system, structural system of buildings designed to withstand lateral loads caused by wind and seismic activity as per respective IS codes Seismic load IS 1893 Wind load IS 875 (part 3)	8 Hours

Course outcome:

CO1	Draw the typical structural detailing of RCC staircases.
CO2	Draw the typical structural detailing of RCC beam and slab.
CO3	Draw the typical structural detailing of steel beam to beam and beam to column connection.
CO4	Draw the typical structural detailing of Domes, shells, folded plates, flat slab, and grid slab.
CO5	Identify the basic concepts of lateral loads.

Reference:

- A. K. Jain "Limit State method of Design" Nemchand& Bro's, Roorkee
- N Krishnaraju "Design of Reinforced Concrete structures" CBS Publishers
- Shah &Karve "Limit state theory & design of Reinforced structures" structures publication Pune. 4. Park &Paulay "Reinforced Concrete" John wiley& son's
- P. Purushothaman "Reinforced Concrete structural elements" Tata Mcgraw: Hill Publishers, New Dehli. 6. BIS code : IS 456:2000

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1					3									3	
CO2					3									3	
CO3					3									3	
CO4					3									3	
CO5	2													3	
AVERAGE	2				3									3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC76 PROFESSIONAL PRACTICE II

Lectures/Week :03	CIE Marks:50
Studio/Week : 00	SEE Marks :50
Credits :3	Exam Hours: : 03
Total Teaching Hours : 42	

OBJECTIVES:

- To understand the professional responsibilities within the ambit and laws of land, building codes, contract documents and ethics
- To gain insight into valuation, arbitration and building by laws.

MODULE	TEACHING HOURS
MODULE : I Supervision & Contract Administration: Site visits, site meeting. Coordination with Various agencies, site book, site instructions, clerk of works and site office. Bill checking, Quality auditing, handover procedure and final certification. Disputes in contract and architect's role in resolving such disputes. Case studies from practice highlighting disputes in contract and methods adopted to solve such disputes.	8 Hrs
MODULE : II Valuation and Dilapidation: Definitions and architect's role in preparation of valuation and dilapidation reports and certification. Physical and Economic life of building introduction to valuation, essential characteristics, classification and purpose of classification. Method of valuation standard rent and cost of construction.	9 Hrs
MODULE : III Arbitration: Arbitration and conciliation act 1996, arbitrator, umpire, order of reference, selection of arbitrators, power and duties of arbitrators, arbitration award and implementation of award.	8 Hrs
MODULE : IV Byelaws and Easements: Building byelaws, National Building Code, floor area ration, floor space index, floating FAR, Zoning regulations, Easements, various casement rights, architect's role in protecting easements rights.	9 Hrs
MODULE : V Laws related to Property and Land: Land tenure, types of land	8 Hrs

holdings, land registration, easement rights, covenants, trespass and nuisance etc.	

REFERENCES:

1) "Professional Practice for Architects & Engineers" by RoshanNamavathi.
2) "Legal and Contractual Procedure for Architects" by Bob Greenstreet.
3) AJ Legal Handbook.
4) "Professional Practice" by KG Krishnamurthy and SV Ravindra.

COURSE OUTCOME:

After completion of the course, a student will be able to:

CO1	Prepare the building contract documents and site report. Solve the disputes related to Architectural issues.
CO2	Prepare valuation and dilapidation reports.
CO3	Participate in arbitration process and prepare the awards.
CO4	Preparation of drawing as per local Building byelaws.
CO5	Application of legal provisions for easement rights.

MAPPING OF COURSE OUT COMES, PROGRAMME OUTCOMES and PROGRAMME SPECIFIC OUTCOMES.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1						3	2	3		3	2	2		3	
CO2	3							2		3				3	
CO3								3		3				3	
CO4						3	2					2		3	
CO5						3	2					2		3	
AVG	3					3	2	2.6		3	2	2		3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ENG77 ESTIMATION & COSTING

Lectures/Week :02	CIE Marks:50
Studio/Week : 01	SEE Marks :50
Credits :3	Exam Hours: : 03
Total Teaching Hours : 42	

Objective:

To develop the necessary skills for estimation and writing specifications for various types of buildings anddevelopmental work

MODULE	TEACHING HOURS
MODULE:I Introduction:: importance of Estimation, types of Estimates modes ofmeasurements Principle of rate analysis. Factors affecting rate analysis preparation of rateAnalysis of building items.	8 Hrs
MODULE:II Specification: importance of specification detailed specifications of building items.Study of local schedule of rates, PWD system, measurement book, muster roll, running account bill, interim and final certificate.	8 Hrs
MODULE:III Preparation of detailed estimate and abstract of single story building load bearingstructure (long wall & short wall method and center line method)	9 Hrs
MODULE:IV Estimation of RCC works (beam, slab & column with footing). Detailed estimateand abstract of single story RCC framed building Detailed estimate and abstract of sloped roofs with roof materials such asMangalore tiles, AC sheet, GI sheet, PVC sheet supported by steel or wood.	9 Hrs

Module :V	8 Hrs
Preparation of detailed estimate and abstract of water supply works (masonry tank resting in ground & underground pipe network in building) Preparation of detailed estimate and abstract of sanitary works (manhole and septic tank drains)	

Course Outcome (CO)

CO1	Prepares rate analysis for various building components and understands types of estimate and measurement CO:2 writes detailed specification of building components and understand schedule of rate and measurement
CO2	Prepare detailed and abstract estimation of single story building. Co:4 pre pare detailed and abstract estimation of rcc and sloped roof
CO3	Prepare detailed and abstract estimation of water tank and septic tank.
CO4	Prepares rate analysis for various building components and understands types of estimate and measurement CO:2 writes detailed specification of building components and understand schedule of rate and measurement
CO5	Pre pare detailed and abstract estimation of single story building. Co:4 pre pare detailed and abstract estimation of rcc and sloped roof

MAPPING OF COURSE OUT COMES, PROGRAMME OUTCOMES and PROGRAMME SPECIFIC OUTCOMES.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3					3		3		3	2	2		3	
CO2	3							2		3				3	
CO3	3							3		3				3	
CO4	3					3						2		3	
CO5	3					3						2		3	
AVG	3					3		2.6		3	2	2		3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC781 INTERIOR DESIGN.

Lectures/Week :02	CIE Marks:50
Studio/Week : 0	SEE Viva Marks: 50
Credits :2	Exam Hours:
Total Teaching Hours : 28	

Objective:
To introduce the students to the discipline of Interior Design and to develop basic skills required for handling simple interior design projects.

MODULE:I	HRS
Designing the size and form of interior spaces using user : activity analysis and anthropometrics, effect of enclosure, fenestration, color and lighting on perception of interior space, application of scale, proportion to enhance the quality of interior space, psychological effects of space.	6
MODULE:II	
Elements of interior space : design for comfort : climatic comfort, natural and artificial lighting, air conditioning and acoustics.	6
MODULE:III	
Furniture design : Role of furniture, ergonomic factors of furniture design and materials used. Matching furniture to decorative style, fitted furniture, its characteristics and application. Functional classification of space, barrier free design.	6
MODULE:IV	
Surface treatment: decorative material for ceiling, walls, floors drapery upholstery for openings and furniture respectively and matching them with overall color scheme and composition, source and collection of information, elements of indoor plants and interior landscape and use of water.	6
MODULE:V	
Study of different materials used in interior design like steel, glass, pop, aluminum, timber, fabrics, plastic, composite materials, through market survey. Detailed Estimation & specification of Interiors.	4

Assignment:
The class work shall include two interior design projects (one major and one minor) to be handled with complete design, detailed furniture layout, specification for the materials, and their application. The projects shall relate to residential, commercial educational or interiors of other public spaces of smaller scale

- Collection of samples,
- Study & submission of portfolios relating to individual aspect like furniture, accessories, water, special lighting schemes and upholstery.

Note : use of hand skills may be encouraged rather than computer.
Site visits and study tour is compulsory

Reference:

- "Human Dimension and Interior Space" by PaneroJulious & Zelink Martin
- "Design of Interior Environment" by Alexander and Mercourt.
-

Course outcome:

CO1	Application of interior context and space designing
CO2	Explain and apply Interior elements.
CO3	Identify and apply the designing of furniture.
CO4	Explain and apply different surface treatments.
CO5	Explain and apply different materials in interior.

- Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2						3							33	
CO2			3				3							3	
CO3			3				3							3	
CO4														3	
CO5							3							3	
AVG			3				3							3	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

ELECTIVE-C
21ARC782 EARTHQUAKE RESISTANT ARCHITECTURE

Lectures/Week :02	CIE Marks:50
Studio/Week : 00	SEE Viva Marks: 50
Credits :2	Exam Hours:
Total Teaching Hours : 28	

Objective:
To provide awareness and introduction to earthquake prevention measures in building.

MODULE	TEACHING HOURS
MODULE : I Building safety from natural Hazards: an introduction Elementary seismology Earthquake occurrence in the world, plate tectonics, faults, earthquake hazard maps of India and the states. Causes of earthquake, seismic waves, magnitude, intensity, epicenter and energy release, characteristics of strong earthquake ground motions Seismological instruments: Seismograph, Accelerograph, Seismoscope/multi SAR Flexibility of long and short period structures	6 Hrs
MODULE : II Site planning, Building forms and Architectural Design Concepts for Earthquake resistance Historical experience , Site selection, Site development, Building forms : Horizontal and vertical eccentricities, mass and stiffness distribution, soft storey etc., Seismic effects related to building configuration Plan and vertical irregularities, redundancy and setbacks Special aspects : Torsion, appendages, staircase, adjacency, pounding, Contemporary international approaches,	6 Hrs
MODULE : III Performance of Ground and Building in past earthquakes Earthquake effects : On ground, soil rupture, liquefaction, landslides Behaviors of various types of buildings, structures. Seismic Design Principles Concepts of seismic design, stiffness, strength, period, ductility, damping hysteric energy dissipation, center of mass, center of rigidity, torsion and design eccentricities. Seismic base isolation and seismic active control Structural detailing, Innovations and selection of appropriate materials	6 Hrs
MODULE : IV References to code provisions for the buildings, IS 1893 : 2002, IS 4326 : 1993 Seismic detailing provisions: Masonry and Wood building (IS 4326, IS 13828) Seismic Designs and detailing of RCC and steel buildings: IS 1893 : 2002, IS13920 : 1993, IS 456 : 2000 IS 800 : 2004 Brief about Special reinforcing and connection details in structural	6 Hrs

drawings.	
MODULE : V Earthquake Resistant Construction Details. Various types of construction details of Foundations, soil stabilization, retaining walls, plinth fill, flooring, walls opening, roofs terraces, parapets and boundary walls, underground and overhead tanks, staircases and isolation of structures. Local practices: traditional regional responses. Seismic vulnerability evaluation of existing buildings. Weakness in existing buildings, aging weathering, development of cracks. Concepts in repair, restoration and seismic strengthening, materials and methodologies for seismic retrofitting. Retro fitting for earth quake resistant building . Assignment: Seminars on one case study and proposal need to be conducted examples.	4 Hrs

REFERENCES:

1. Martin Bechthold, Daniel L Schodek , "Sructures", PHI Learning Private limited.
2. Pankaj Agrawal and Manesh Shrikande , "Earthquake resistant design of structures", PHI learning Pvt. Ltd.
3. Dr Vinod Hosur , "Earthquake resistant design of building structures", Wiley Precise.
4. "Learning earthquake design and construction: earthquake tips", IIT Kanpur: NICEE
5. IS: 4326: Seismic detailing of Masonry buildings.
6. IS: 1893:2002, IS: 13920:1993 , IS: 456:2000, IS: 800:2007 : Seismic design and detailing of RC and steel structures

COURSE OUTCOME :

CO1	Applying various aspects of earthquake resistance design.
CO2	Implementing Site planning, Building forms and Architectural Design Concepts for Earthquake resistance
CO3	Applying concepts and principles of seismic design
CO4	Applying Seismic detailing provisions
CO5	Designing and implementing various construction methods and strategies

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3													3	
CO2			3			3	3					2	3		
CO3		3	3									2	3		
CO4	3		3					2						3	
CO5			3	3	2		3								3
AVERAGE	3	3	3	3	2	3	3	2				2	3	3	3

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC81 ARCHITECTURAL DESIGN-VIII

Lectures/Week :01	CIE Marks:50
Studio/Week :08	SEE Viva Marks: 50
Credits :9	Exam Hours:
Total Teaching Hours : 126	

INTRODUCTION:

In an increasingly urbanized world, architecture plays a vital role in shaping and influencing complex urban environment (the design of cities) and creating meaningful places that enrich the lives of people. It is important to understand the many scales at which architecture can engage with the urban context, from building on the unique local character/form to enhance public spaces to urban development projects (infrastructure/transport interchanges/terminals) that impact larger geographic region beyond the city. The Studio intent is to introduce the discipline urban design (interdisciplinary premise, scope, techniques and best practices) and understand architecture as a part of implementing urban design projects, from gathering insights into urban fabric to understanding how communities use spaces.

OBJECTIVES:

- To introduce the student to the field of urban design and various aspects of the design process
- Introduce the students to the fundamental techniques of urban design schemes.
- Identify and analyze urban design issues and problems.
- Create an understanding of various factors such as physical, social, economic and infrastructural components and decision making processes.

OUTLINE	**TEACHING HOURS**
PROJECT • The probable architectural design projects include urban infill, revitalization and renewal of urban fragments. • Adaptive reuse, urban waterfront development, transportation nodes/interchanges, multiuse urban complexes including museums, performing arts centers. • The project will choose a particular neighborhood in a chosen city in order to comprehend the process of documenting the neighborhood. • With its actual character and developing scenarios that will clearly illustrate the need for improvement. • To illustrate contemporary multidisciplinary theories of form, space of urban design. OUTLINE: The studio will be divided into two components. Analysis and brief study of an urban context (mapping techniques), documenting the issues affecting the area. To develop design strategies that enhances spaces for communities. The	126 Hrs

focus will be on understanding the Concepts of "Fabric, Texture and Weave". Evolving design intervention addressing the issue identified with the help of goals and objectives.	

COURSE OUTCOME:

CO1	Analyzing various urban design projects and concepts.
CO2	Analyzing and documenting the issues.
CO3	Prepare various design strategies.
CO4	Formulating vision.
CO5	Application of vision and strategy to individual's intervention.

REFERENCES:

(a) Donald Watson, "Time Savers Standard for Urban Design", 2005, McGraw Hill.
(b) Jon Lang, "Urban Design: A Typology of Procedures and Product", 2005, Routledge.
(c) Edmund Bacon, "Design of Cities", 1976, Penguin Books.
(d) Gosling and Maitland, "Urban Design", 1984, St. Martin's Press.
(e) Kevin Lynch , "Site Planning", 1967, MIT Press, Cambridge.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3											3		
CO2				3	3	3	3							3	
CO3			3			3								3	
CO4											3	3		3	
CO5									3	3		3			3
AVERAGE	2	3	3	3	3	3	3		3	3	3	3	3	3	3

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

21ARC82 ADVANCED BUILDING CONSTRUCTION AND MATERIAL

Lectures/Week :01	CIE Marks:50
Studio/Week : 05	SEE Viva Marks: 50
Credits :6	Exam Hours:
Total Teaching Hours : 84	

OBJECTIVE:

- To study contemporary building construction systems, as an integrative discipline, connecting across various technology areas impacting the construction industry.
- The focus to be on methods, materials and technology prevailing in the industry, with case study examples.

MODULES	TEACHING HOURS
MODULE :I • New directions in Construction Industry: Impact of Automation, Information, Prefabrication, Modular Construction, New Materials, Equipment and Environmental concerns on Building Construction. • Special Constructions: Under water constructions, underground constructions, kinetic constructions High Rise Buildings: • Form work in High:rise buildings: Issues and Constraints. Materials used; some examples like Maivan, Doka. PERI • Enclosure Systems: Types, properties and materials • Special and Light Weight materials, eg. Concretes, plastics	20 HRS
MODULE :II • Influence of Informatics in construction Industry: Big Data, Cloud Collaboration, Information Management, Modeling, Simulation, 3D Printing • Construction Equipment: New advances in Construction Equipment	15HRS
MODULE :III • Life Cycle concept of buildings and materials. • Repairs: Types of damage to buildings; Types of Repairs used Retrofit: Reuse of buildings, Renovations	15HRS
MODULE :IV Green Building Concepts, Construction, Materials Zero Energy Building Concepts	20 HRS
MODULE :V • Smart Materials: Properties of Smart Materials, Applications in Building Industry • Nano Materials: Introduction to Nano technology in building materials, Applications in Building Industry	14 HRS

Note: A consolidated portfolio containing exercises related to each of above topics are to be submitted for term work examination.

Reference:

- Andrew Watts, "Modern Construction Handbook", 4th Edition
- Andrew Watts, "Modern Construction Case Studies: Emerging Innovation in Building Techniques", Birkhauser Basel.

COURSE OUTCOME

CO1	Understand the new directions in construction industry and techniques performed in high rise buildings.
CO2	understand the influence of informatics and construction equipment's in construction industry
CO3	Understand the life cycle concepts of buildings and materials and analyze the repairs and retrofits.
CO4	Analyze the green building concepts.
CO5	Understand the smart materials, Nano materials.

Coursse Outcomes with Program Outcomes and Program Specific Outcomes mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO 1	2		2		1					1			3		
CO 2		1											3		
CO 3				2								2	3		
CO 4	1			1			2		1				3		
CO 5				2									3		
AV G	1	1	2	2	1		2		1	1		2	3		

CONTRIBUTION; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC83 PRE ARCHITECTURAL DESIGN PROJECT

Lectures/Week :01	CIE Marks:50
Studio/Week :02	SEE Viva Marks: 50
Credits :3	Exam Hours:
Total Teaching Hours : 42	

Introduction/Overview:

The Thesis Seminar course is designed to discover, frame and develop a Proposal for VIII Architectural Design Project. The objective of the Thesis Seminar is to expand the scope and focus of the student by introducing diverse topics in architecture (allied disciplines) and to nurture design/research projects that can make creative and technically competent contributions to the field of architecture. The intent of the Thesis Seminar is to encourage new ideas/research avenues/design experimentation in architecture (allied disciplines); to provide a larger framework (structure) within which systematic research on a chosen Topic can be undertaken; to develop a proposition, narrative and methodology for the chosen topic which can be tested through design in VIII Semester.

The Thesis Proposals can be developed from important issues on architecture (inter:disciplinary), hypothetical scenarios connected with architecture (theoretical premise) or live/ current projects proposed by government or other organizations.

Objective:

In depth study of building type & area of interest selected for Architectural Design Thesis in 8th semester as a database.

- To outline the larger focus and relevance of the Thesis topic (design/research), its architectural implications and projected design results.
- Alternatively, to conceptually formulate an architectural proposition, explore and articulate ideas through research and critically evaluate the feasibility of the Thesis Proposal. This includes determining the Project, context where it shall be explored and its significance to architecture.
- To encourage students to pose relevant questions on the discipline (theoretical/design); to undertake self:directed study with inquisitiveness, rigor and demonstrate a depth of inquiry in exploring the chosen topics.
- To focus on innovation, experimentation (theoretical premise/ tectonics/modes of representation/other) as some of the learning outcomes and draw inspiration/build on the various Electives/Design Studios proposed/taken through the undergraduate Program .

OUTLINE	**TEACHING HOURS**
Outline: The work involves identification & research of an area of interest & specific building type with certain issue become the basis of design (Ex: Thermal comfort, Low cost, Sustainable, Construction technology,	42

Cultural context etc), which in turn becomes a basis for Architectural Design project dealt in next semester.
 	
• Pre:Project: :The stage should ideally be accomplished in this semester. The work involves students to discuss with the faculty to identify an area of interest & specific types of buildings. The pre project stage should end with a conclusion drawn from literature and desktop case studies. Formation of clear design guidelines and "project program".
 	
• Project seminar : Student shall present a seminar on the project topic, which would include the following;
  • Precedents of similar projects, either actual visit to such projects or through literature reviews.
  • Cultural, contextual, historical models of architectural approach to such project,
  • Prevalent or historical models and
  • Rhetorical (symbolic) or a speculative (tentative) statement that would be the basis of further investigation. (For example: Architecture in the information age: Design of libraries, in the new virtual reality regime).
  • Documentation which is a part of this presentation shall be taken as completion of "Desktop case study" and design guidelines as a part of the final requirement
  • Site selection place and finalization of program for Architectural Design thesis	

Submission The study shall be submitted in the form of report & a seminar should be conducted for each student. The study shall be carried under the guidance of staff. The final outcome shall include a formal submission of • (a) Written Synopsis (key ideas on the topic including premise, description/ justification and conclusion) and Thesis Proposal Document (booklet) clearly highlighting/explaining the Project type; architectural Proposition/ Premise; Site/ Location; Scope and Limitations; Program (includes basic documentation with drawings, images or photographs of context, case studies, citations to various sources) • (b) Portfolio of presentations, critical readings, drawings/ models produced by the student on the chosen topic (urban issue/conservation/sustainability/digital architecture/other) • • (c) The grading shall consider the participation and depth of inquiry presented by each student and the various submissions/ reviews on each topic organized through the term.	

COURSE OUTCOME:

CO1	Identify different types of design projects & recognize area of student's individual interest
CO2	Analyze different project topics & its scope, scale & requirements
CO3	Utilize the selected project topic for further analysis
CO4	Identification of suitable case studies & analysis of proposed site conditions with respect to its surroundings
CO5	Formulate design project feasibility in terms of structure, services &aesthetics.

REFERENCES:

- All references will be project specific and will include a wide range of subjects (history, theory and criticism; services; material and construction) from architecture and allied fields addressed through critical papers, essays, documented studies and books.
- Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons,2002
- Iain Borden and Katerina Rüedi, The Dissertation, Architectural Press, 2000

CO PO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O 2	PS O 3
CO1		3													3
CO2			3												3
CO3			3												3
CO4				3											3
CO5		3													3
Average		3	3	3											3

21ARC84 CONSTRUCTION MANAGEMENT

Lectures/Week :03	CIE Marks:50
Studio/Week :	SEE Marks: 50
Credits :3	Exam Hours: 03
Total Teaching Hours : 42	

Objective:

- To provide an insight into Management of Building/Construction projects involving management of money, manpower and machinery.
- To enhance the professional ability of the students to manage a construction project by exposing the students to the currently prevalent techniques in the planning, programming & management of a construction project.

MODULE	TEACHING
MODULE:1 (Introduction to Construction Project Management & construction organization) 1. Introduction to projects, its stages & Construction Project Management: Need for management of building /construction projects, principles & objectives of Project Management, brief understanding about study areas in Project Management, projects, types of construction projects & life cycle/stages of a project. 2.Construction Organization: types of construction firms/companies. Types of organization, study of organizational structures suitable for building and construction projects, the roles of the various members of a typical construction organization, qualities of an ideal construction organization, ethics in construction industry. .	8 Hrs
MODULE:2 <u>MODULE:2 (Decision making & role of Project managers)</u> • Decision making and Feasibility Study: Involvement and Roles of Consultants and Contractor in decision making at various stages. Basic understanding of decision making principles and tools (e.g. Decision Tree, SWOT Analysis, Cost:Benefit Analysis), Value Engineering, Investment Criteria, Project Feasibility Study. • Roles of Project Manager: Roles & Responsibilities of Project/ Construction Managers, Scope Management in Construction: Scope Planning, Definition, Verification and Control	8 Hrs
MODULE:3 (Construction Management techniques: Project planning & scheduling) 1. Project planning & scheduling in construction: network, elements of network & their relations, Activity definition, activity sequencing,	9 Hrs

event, their relations, dual role of event, dummy activity, network rules, graphical guidelines for network, numbering of events, work breakdown structure. CPM & PERT Networks. 2.Construction Management techniques : project scheduling:Bar Chart, Mile Stone Chart, Networking analysis using PERT and CPM. Projects cost Analysis & project crashing using CPM, Resource leveling and Resource smoothening. Computer applications in Project Management: Introduction to use of computer softwares for analysis of network: Primavera, Microsoft Project Schedule (MSP) or Project Libre)	
MODULE:4 *(Project Monitoring and Control)* • Construction Management Techniques: Project Monitoring and Control : Role of the project manager in monitoring the specifications, Follow:up for quality control, the measurement book (MB), RA bills, interim and final checking and certification of works on site based on the BOQ and terms of contracts. Project updating, Progress Curves. • Quality Management in Construction: Quality Planning and Quality Control. Technical Specifications and Procedures. Codes and Standards. Construction Health and safety and management: Safety Measures and management: Integrating workers Health and Safety into management.	9 Hrs
MODULE:5 *(Use of Construction Equipment)* • Construction 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. • Types of Construction Equipment: earth moving (tractors, excavators, dragline, trenching equipment, etc.,) transporting (various types of trucks), spreading and compacting (motor graders and various types of rollers) and concreting equipment (including concrete mixers, transporting and pumping equipment),	8 Hrs

Note : Use of software to be encouraged although the same is not for the examination purposes.

COURSE OUTCOME:

CO1	Recognize importance & objectives of construction management & application of organizational structures suitable to different projects in construction Industry.
CO2	Analyze role of construction/project managers & other stakeholders in decision making
CO3	Application of construction management techniques suitable to project planning & scheduling
CO4	Application of project monitoring & controlling
CO5	Identify & application of various construction equipments suitable as per project requirements.

Reference:

- 'Construction Planning, Equipment and Methods' by RL Peurifoy
- 'Project Management for Architects' by S P Mukopadhyay
- 'Part and CPM' by L S Srinath

CO PO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O 2	PS O 3
CO1								3	3		3			3	
CO2											3	2		3	
CO3	3				3			3		3	3			3	
CO4		2				3			3	3	3			3	
CO5	3													3	
Average	3	2			3	3		3	3	3	3	2		3	

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21ARC85 LANDSCAPE DESIGN

Lectures/week :3	CIE marks:50
No of credits :3	SEE marks:50
Total number of lecture hours:42	Exam Hours :3

OBJECTIVE:

To introduce students to the discipline of landscape architecture and to develop basic skills required in handling simple landscape design projects.

MODULES	TEACHING
MODULE:1 Introduction to Landscape Architecture, definition, importance, need and scope, Role of landscape design in architecture. Natural and manmade landscape, urban and rural landscape. Landscape elements (Major and Minor Elements, Tangible, and Intangible elements, Soft and Hard landscape elements).	8 Hrs
MODULE:2 **Study of Plant Materials:** Trees, shrubs, ground cover, climbers, Indoor plants. Plant selection criteria: Functional, visual, ecological, and microclimatic aspects. The role of plant material in environmental improvement (e.g., soil conservation, modification of microclimate). Planting for shelter, windbreaks, and shelter belts. Prepare BOQ for small project	8 Hrs
MODULE:3 Principles of landscape design (harmony, balance, symmetry, contrast, etc.) Surfacing, Enclosure, Vistas, Visual corridor. Site Studies and Site Planning: Introduction to grading, Landform modifications; Earth form grading; Basic grading principles, Cut and fill processes, Retaining walls.	8h Hrs
MODULE:4 Introduction to historical gardens like Mughal, Chinese, Japanese, Indian etc Study of notable examples.. Study and analysis of contemporary landscape designs with two or three examples	9 Hrs
MODULE:5 Study of landscape of courtyards, roads, pathways, urban spaces, gardens, parking areas etc. Basic principles of planting design; Spatial development in landscape design; Detailed landscape design of any small project including paving and street furniture design	9 Hrs

COURSE OUTCOME

With the successful completion of the course student should have capability to

CO1	Analyze the role of landscape Architecture in terms of Urban and Rural.
CO2	Exhibit knowledge about various landscape construction techniques and plant materials
CO3	Understand the landscape principles involved in various design concepts.
CO4	Understand and analyze various historic and contemporary landscape designs
CO5	Prepare the procedure of planning, study analyze and implementation

Reference:

- Landscape architecture by J .O. Simonds
- The landscape we see :Garrett Eckbo
- Introduction to landscape architecture by Michael Laurie.
- Time Saver Standards for Landscape architecture

CO PO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O 2	PS O 3
CO1															
CO2															
CO3															
CO4															
CO5															
Average															

CONTRIBUTION: 1.REASONABLE 2.SIGNIFICANT 3.STRONG

21CIPE86 CONSTITUTIONAL LAW

Lectures/Week :01	CIE Marks:50
Studio/Week : 00	SEE Marks: 50 (MCQ)
Credits :1	Exam Hours: 02
Total Teaching Hours : 28	

COURSE OBJECTIVES:

- To educate students about the Supreme Law of the Land.
- To create an awareness about Civil Liberties.
- To enhance awareness and consciousness of the issues related to the profession and discuss the issue of liability of risks and safety at work place.

MODULE	TEACHING HOURS
MODULE:1 Framing of the Indian constitution: Role of the Constituent Assembly : Preamble Salient features of the Constitution of India, Fundamental Rights and its limitations. Fundamental Duties and their significance.	6 Hrs
MODULE :2 Directive Principles of State Policy: Importance and its relevance. Special Constitutional Provisions for Schedule Castes, Schedule Tribes & Other Backward Classes. Constitutional provisions for safety and protection of rights of women and children in society and at workplaces.	6 Hrs
MODULE :3 The Union Executive: The President and The Vice President, The Prime Minister and the Council of Ministers. The Union Parliament : LokSabha & RajyaSabha. State Executive : The Governors, The Chief Ministers and The Council of Ministers. The State Legislature: Legislative Assembly and Legislative Council. State High Courts. Functioning of Judiciary in India.	6 Hrs
MODULE :4 Election Commission of India: Powers & Functions : Electoral Process in India. Methods of Constitutional Amendments and their Limitations. Important Constitutional Amendments.	6 Hrs
MODULE :5 Definition of ethics, Professional ethics as laid down by Council of	4 Hrs

Architecture, RIBA, Indian Institute of Architects, Institution of Engineers & Valuers etc.	

Course Outcomes:
At the end of the course the student should be able to:

CO1	Identify the significance of Indian Constitution as the fundamental law of the land.
CO2	Understand special provisions for SC/ST, BC & application of safety measures, protection of rights for women & children at workplace
CO3	Analyze & apply the Indian political system, the powers and functions of the Union, State and Local Governments in detail
CO4	Recognize Electoral Process, Emergency provisions and Amendment procedure.
CO5	Application of professional guidelines & ethics laid by concern regulatory bodies.

TEXT BOOKS:

- Merunandan K.B. and B.R. Venkatesh, "An Introduction to Constitution of India and Professional Ethics", Meragu Publications, 3rd edition, 2011.
- Phaneesh K. R. , "Constitution of India and Professional Ethics", Sudha Publications, 7th edition, 2014.

REFERENCES:

1. Pylee M. V, "An Introduction to Constitution of India", Vikas Publishing, 2002.
2. Martin, W. Mike., Schinzinger, Roland, "Ethics in Engineering" McGraw:Hill, New York 10020, fourth edition, 2005.
3. Ghai K .K. &. RoohiMakol E R , "Constitution of India and Professional Ethics", Kalyani Publishers.1stedition, 2009.

E:BOOK:

- https://books.google.co.in/books/about/Constitution_of_India_and_Professional_ E.html?id=VcvuVt:d88QC G.B. Reddy and MohdSuhaib, I.K , "Constitution of India and Professional Ethics", International Publishing House Pvt. Ltd., 2006.

- http://www.scribd.com/doc/82372282/Indian:Constitution:M:Raja:Ram:2009# scribd M. Raja Ram, "Indian Constitution", New Age International Pvt. Limited, 2009.

CO PO Mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1							3						3		
CO2						3							3		
CO3							3						3		
CO4							3						3		
CO5									3				3		
Average						3	3		3				3		

ELECTIVE:D

21ARC871 ENERGY EFFICIENT BUILDING DESIGN

Lectures/Week :01	CIE Marks:50
Studio/Week : 01	SEE Viva Marks: 50
Credits :2	Exam Hours:
Total Teaching Hours : 28	

Objective:
To familiarize the students with simple and passive design consideration, use of natural ventilation in building design and to make the students aware of the future trends in creating sustainable built environment.

SL	MODULE:I	HRS
1	Significance of energy efficiency in the contemporary context. Alternative means of energy, use of energy in a built environment, use of energy at site level, impact of built structure on microclimate.	6 Hrs
	MODULE:II	
2	Simple passive design considerations involving site conditions, building orientation, Plan form, building envelope and materials, sources of energy.	6 Hrs
	MODULE:III	
3	Wind energy, tidal energy etc. Measures to mitigate the electricity consumption.	6 Hrs
	MODULE:IV	
4	Ways and means of mitigating use of energy, Passive Solar techniques (For hot:dry and warm humid region)	6 Hrs
	MODULE:V	
5.	Construction and techniques: Use of alternative material, various levels of usage in building, use of latest technologies.	4 Hrs

Assignment:
The assignment may be given as a group work (2 to 3 students per group). The students have to submit are port on the work of a project with energy efficiency.
Course Outcome:

CO1	Identify alternate means of energy and apply in built environment.
CO2	Explain and identify the application of passive design
CO3	Measures to mitigate the electricity consumption and its application
CO4	Application of passive solar techniques in designing.
CO5	Identify latest technologies and apply the construction methods in designing.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1							3							2	
CO2						2									
CO3						2									
CO4					3										
CO5					3										
AVERAGE					3	2	3							2	

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

ELECTIVE-D

21ARC872 FURNITURE DESIGN

Lectures/Week :01	CIE Marks:50
Studio/Week : 01	SEE Viva Marks: 50
Credits :2	Exam Hours:
Total Teaching Hours : 28	

Objective:
To understand fundamental aspects and cultural considerations of Furniture Design from Ancient to modern times.

SL	MODULE:I	HRS
1	Introduction to Furniture Design styles: antique, traditional, modern, contemporary, classical etc. Study of Furniture Design Style to exemplify the method to understand the art form and appreciate them in the context of culture, Understand ergonomics and human anthropometrics.	6Hrs
	MODULE:II	
2	Current trends in furniture design. Types of furniture like built-in (cabinetry etc.), modular, manufactured, custom-made for seating, storage, sleeping, street furniture and office furniture.	6 Hrs
	MODULE:III	
3	Study of materials in furniture : timber, plywood, bent wood, bamboo/cane, metal, plastics, polyurethane and glass. Upholstery materials : leather, natural and synthetic fabrics.	6 Hrs
	MODULE:IV	
4	Study type of finishes like laminate, veneer, lacquer, varnish, stains, polish and Ability to comprehend human dimensions and body movement to arrive at a usable product adhesive.	6 Hrs
	MODULE:V	
5.	Understanding selection of furniture, cost and longevity. Study of technology, wood joinery, sections, framework, detailing. Design furniture using found object. Design project like furniture layout, relationship to context and design of furniture.	4 Hrs

Course outcome:

CO1	Identify different styles in furniture design and apply in ergonomics; human anthropometrics.
CO2	Application of current trends in furniture design.
CO3	Identify different furniture material and its application on different type of furniture.
CO4	Explain different finishes and its application in furniture design.
CO5	Design of different style of furniture and applying it in layout design.

Course Outcomes with Program Outcomes and Program Specific Outcomes mapping

COURSE OUT COMES	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
CO1	3													2		
CO2			3													
CO3			3													
CO4					3											
CO5					3											
AVERAGE	3		6		6											

CONTRIBUTION: 1: REASONABLE 2: SIGNIFICANT 3: STRONG

V YEAR SYLLABUS
B.ARCH

SYLLABUS CONTENTS OF IX SEMESTER B.ARCH.

21ARC91: PROFESSIONAL TRAINING.

1st Part of 5th year

Contact Period/Week :16 1/2	CIE Marks : 50
Credits: 26	SEE Viva Marks: 50

Objective:

To provide exposure to the various dimensions of architectural practice.

OUTLINE	
Outline :(at the end of 9th semester) Each student of Ninth. B. Arch shall undergo a practical training during the 1st term the final year (second stage of B. Arch Course), which shall be of minimum 16½ weeks in each semester as per the instructions given by the Head of the department from time to time and as per regulations AR 6.6 of B. Arch Attendance shall be **100%** during the training period, i.e., he/she shall complete total minimum 100 working days each in 9th semester totaling to minimum 100 working days of training excluding Sundays, holidays and leaves etc. in the architect's firm. The trainees shall regularly send the fortnightly report duly signed by the Chief of their respective firms, in the prescribed format only as per the instructions to the candidates given below every fortnightly The students during the training must work in accordance with the discipline of the organization. Any complaint regarding the indiscipline and irregularity shall be viewed seriously. The type of work a student should expose himself shall be • To assist the senior Architect in Design process including conceptualization, circulation etc. • Assist in preparation of working drawings including study of the materials, constructional details and understanding application of the same on site. • Preparation of permission drawings for Govt. authorities including thorough knowledge of local building bylaws etc., and area analysis considering bylaws. • Preparation of Architectural models, computer applications in design and drafting, filing system in respect of documents, drawing, ammonia prints, preparation of tender documents • Site visits etc., with due importance to the practical handling of materials, stacking etc. and problems evolved on site and their solutions. Study of taking measurements and recording etc. • In depth study of any new advanced typed of building material highlighting its properties, uses, applications, merits and demerits, cost factor etc. • Critical appraisal of any one public building designed preferably in the office.	

• Architects biodata including all the projects done and executed by him, his design philosophy and concept, awards, competitions won, etc., through photographs, plans, sections, elevations and write up.	

Submission (at the end of 9th semester)

- Certificate of completion of training and log book containing the record of the work done during training and confidential report
- All drawings done in the office certified by the senior architect in the firm, photographs of site visited
- Submit in the following Heads: 1. Working drawing, 2. Presentation drawings, 3. Site visits, 4. Photographs of models 5. Estimation of steel and wood (optional)
- Samples of building Materials, Hard and soft copy of the report.
- Critical appreciation of the public building designed preferably in the office
- Hard and soft copy of the general profile of the office containing the brief history, design philosophy, works executed : past and current, the resume of the chief architect with photograph etc.

COURSE OUTCOME:

After completion of the course, a student will be able to:

CO1	Ability to prepare design, approval, documentation of a project.
CO2	Apply legal, ethical, & technical standards for projects.
CO3	Apply Management techniques for the projects.
CO4	Implement the architectural bye : laws in construction and various services involved in the design of a building.
CO5	Prepare tender documents and ammonia prints for the projects.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1							2		3						2
CO2									3						
CO3															3
CO4						3			3					2	
CO5						3			3						3
AVG						3	2		3					2	2.6

CONTRIBUTION ; 1. REASONABLE 2; SIGNIFICANT 3; STRONG

21ARC 101 – ARCHITECTURE DESIGN PROJECT (Thesis)

Lectures/Week : 2	CIE Marks : 50
Studio/Week : 1**6**	SEE Viva Marks: 50
Credits: 18	Exam Hours:
Total Teaching Hours :252	

Objective:

- To demonstrate an ability to comprehend the nature of architectural problem and create a brief which sets the framework for design.
- To demonstrate an advanced level design ability to convert the brief set forth earlier into a speculative proposition of design.
- To articulate and delineate the propositions of design into an architectural solution addressing all the dimensions.

OUTLINE	
Outline: Architectural Design projects can be of any scale and size (in terms of built area) as long as the required rigor and depth is demonstrated by the student to merit consideration as a final project. Very large campus projects can be avoided as the work tends to be repetitive and more often ends with a large number of Structure but with minimal variations and content. It is expected that all type of projects (study or design) would end with a design solution; in fact all projects (study or design) would end with a design solution; in fact all projects should be grounded in some kind of critical enquiry. The maximum weight age for study will be 25% in the case of a Study + Design can be reduced in a specific case, but such a project should demonstrate clarity in terms of research design. The following stages have been identified as a generic model of the studio. The stages can be fine: tuned depending on the resources. It is expected that this project will be run as a studio with individual guidance under a project coordinator and assisted by several guides. **Early Review –**There shall be a review to clarify the conceptual statement and synthesizing the analysis carried out by student and the assumptions of the student. Students shall present a clearly articulated response to context, program and users; Conceptual framework and preliminary architectural scheme shall be the end products of this stage. **Mid Review –** this review shall aim at fairly clear drawings of the entire scheme with reference to the objectives practiced in all earlier semesters and give a clear understanding of the project proposal. The preliminary report in typed or computer printed form shall be presented	

to discuss the program, site – analysis, literature review, case studies, design criteria, concept and detailed design. **Final Review :** Final review should consist of all the works, which would be presented at the viva. Mode of presentation shall be drawings draw to proper scale supported by a on screen digital presentation. Number of sheets shall be limited to maximum of 15 to 20 of A0 size plus three to five case study sheets. Study Models shall be presented	

Note: :

1) The requirements pertaining to the handicapped and elderly people and children are to be addressed in design and detailing.

2) At the time of Viva examination, the student shall show to the jurors the portfolio containing the evolution of his/her design from the beginning to the final output. All the drawings and reports shall be certified by the Head of the Department as bonafide work carried out by the student during the semester.

Final Submission

The final output shall include a report, all drawings study models, and a presentation model. The hard and soft copy of report shall discuss the program, site:analysis, literature review, case studies, design criteria, concept and detailed design. Three copies of the reports & a digital presentation in CD shall be submitted along with competed set of drawings and models at least 4 days before the viva exam.

Digital presentation shall be sent to the external examiner by the department well before viva examination

Note :There shall be 3 examiners such as 1 internal examiner & 2 externals, preferably one from professional one from academic background.

21ARC102 SUSTAINABLE ARCHITECTURE.

Lectures/Week : 1	CIE Marks : 50
Studio/Week : 2	SEE Marks: 50
Credits: 3	Exam Hours: 3
Total Teaching Hours :42	

Objective: To introduce the student to the discipline of sustainable architecture. Learning various methods of sustainable Architecture, which could be adopted in architectural design with respect to the local climate and region.

MODULES	TEACHING HOURS
MODULE:I • Introduction to Sustainable Architecture. Present scenario of Environment. Architect's role in regarding environmental degradation. Needs & advantages of sustainable architecture.	8
MODULE:II • Sustainability in planning: Various aspects of sustainability in site planning and planning of building. Planning techniques : efficient space utilization, minimum exposed hard surfaces, usage of landscape elements for various needs of site etc. • Climate: Various means of passive techniques in buildings with respect to local climate. Indoor temperature management. Local techniques of passive architecture.	8
MODULE:III • Materials: Selection of materials based on environmental qualities, Use of local materials, recyclable and reusable materials and low energy embodied materials, etc.	8
MODULE:IV 5 .Construction techniques: Various methods of constructions that are considered to be sustainable. Services: • Sewerage: Sewerage system and its disposal, treatment methods within the site, • Electricity: Ways and means of reduction in electricity consumption. Use of solar energy for lighting of building, road, parks and garden, water pumping etc. use of solar panels as architectural feature. • Water: Rainwater harvesting, recycling and reuse of water, recharging of water table, methods of water treatment within the site, ways and means of reducing consumption of water.	9
MODULE:V 6. Waste management: Recycling & reuse of waste produced	9

within the site. Concepts like Biogas and biomass plant, Vermiculture etc. • .Role of LEED India and TERI GRIHA etc in certification process for Green buildings	

Assignment

Seminars on one case study and proposal need to be conducted examples.

References

- Energy: efficient buildings in India by MiliMuzumdar
- Climate responsive architecture by ArvindKrishan and team
- Tropical architecture by C P Kukreja
- Housing, climate and comfort by Evan Martin
- Design with climate by Victor Olgey
- Climatic design by D Watson
- Green Architecture by Micheal J. crosbie

Solar Architecture

21ARC103 SEMINAR

Lectures/Week : 1	CIE Marks : 50
Studio/Week : 5	SEE Viva Marks: 50
Credits: 6	Exam Hours:
Total Teaching Hours :84	

OBJECTIVE:

- To outline the larger focus and relevance of the Thesis topic (design/research), its architectural implications and projected design results.
- Alternatively, to conceptually formulate an architectural proposition, explore and articulate ideas through research and critically evaluate the feasibility of the Thesis Proposal. This includes determining the Project, context where it shall be explored and its significance to architecture.
- To encourage students to pose relevant questions on the discipline (theoretical/design); to undertake self: directed study with inquisitiveness, rigor and demonstrate a depth of inquiry in exploring the chosen topics.

OUTLINE	TEACHING HOURS
• The Thesis Seminar can be conducted as a combination of interactive workshops, presentations/ seminar, key lectures and focused discussions with individual students on chosen topics. Each topic should be studied using extensive literature reviews including readings in relevant critical theoretical/ philosophical premise; case studies (site visits); focused meetings with internal subject/ topic experts and design research methods. • The Thesis Seminar should be seen as an opportunity to engage with a topic/ question on the discipline architecture through reading, writing, drawing, diagramming and modeling ideas. • The role of the Thesis guide/ subject internal member is to introduce the students to issues relevant to architecture. Significant design research methodologies and discuss the new research directions in the discipline through readings, exercises and workshops. • The Thesis guide/ subject internal member shall also critique student ideas/ research and help formulate/ shape a design/ research method. The dedicated discussion sessions on topic should clarify the intent, type of project, location, scope and limitations.	84

Note:

- Written Synopsis (key ideas on the topic including premise, description/ justification and conclusion) and Thesis Proposal Document (SSR) clearly highlighting/explaining the Project type; Architectural Proposition/ Premise; Site/ Location; Scope and Limitations; Program (includes basic documentation with drawings, images or photographs of context, case studies, citations to various sources)
- Portfolio of presentations, critical readings, drawings/ models produced by the student on the chosen topic (urban issue/ conservation/ sustainability/ digital architecture/ other) The internal and external grading shall consider the participation and depth of inquiry presented by each student and the various submissions/ reviews on each topic organized through the term and in final conduction of jury.

Reference:

- All references will be project specific and will include a wide range of subjects (history, theory and criticism; services; material and construction) from architecture and allied fields addressed through critical papers, essays, documented studies and books.
- Linda Grant and David Wang, Architectural Research Methods, John Wiley Sons, 2002.
- Iain Borden and Katerina Ruedi, The Dissertation, Architectural Press, 2000.

COURSE OUTCOME

With the successful completion of the course student should have capability to

CO1	Explain the procedure and methodology of the report with interactive session.
CO2	Implement the ideas based on relevant topic literature and case studies.
CO3	Understand different diagramming and modeling ideas through different skills.
CO4	Analyze the area of interest or issue related to the design.
CO5	Prepare on topic with the intent, type of project, location, scope and limitations.