



Koneru Lakshmaiah Education Foundation

(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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Campus: Green Fields, Vaddeswaram - 522 302, Guntur District, Andhra Pradesh, INDIA.

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XXXVII Academic Council – Annexure -3.3

DEPARTMENT OF ARCHITECTURE MINUTES OF BOARD OF STUDIES MEETING

The Department of Architecture has conducted its twelfth Board of Studies meeting on 10.12.2022 on online mode starting at 2.00 p.m

The following members were present in the meeting:

1. Ar. Venkatesan Selvaraj: Principal- Chairman
2. Ar. Priya – Associate Professor – Member
3. Ar. Kiran Kumar Bonda- Dy. H.O. D and NAAC In charge
4. Ar. Tanushree Das - Associate Professor, Academic In charge
5. Ar. Saleem A Qureshi- Practicing Architect (Designer' Group, Hyderabad) – External Member
6. Ar. Ashok Grover- Principal architect: Ashok Grover & Associates -External Member
7. Dr. (Prof.) Janmejy Gupta- School of Planning and Architecture, Vijayawada- External Member

Members absent: Nil.

Webex meeting Link:

<https://kluniversity.webex.com/meet/cr122>


Ar. V. Selvaraj,
PRINCIPAL-ARCH, KLEF.



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School Of Architecture Board Of Studies (Online Mode) Minutes Of the Meeting

Meeting No:	KLEF/ARCH/BOS/012	Date	10.12.2022
Academic Year	2022-23	Time	2:00 p.m. to 3.30 p.m.
Venue	Online		

The school of Architecture, KL University conducted 12th B.O.S. on online mode (using Webex meeting link) on 10th December 2022, from 2 p.m. to 3.30 p.m.

The following internal members were present:

In chair: AR. VENKATESAN SELVARAJ

Members Present:

S. No	Name	Designation	Department
1	Ar. Venkatesan Selvaraj	Principal, DAC chairman	School of Architecture
2	Ar. A. Priya	H.O. D	School of Architecture
3	Ar. Kiran Kumar Bonda	Dy. H.O. D and NAAC In charge	School of Architecture
4.	Ar. Tanushree Das	Associate Professor, Academic In charge	School of Architecture

The following external members were invited and present

1	Ar. Ashok Grover	Industry Experts	Principal architect: Ashok Grover & Associates
2	Dr. (Prof.) Janmejoy Gupta	Associate Professor and Dean – Research	School of Planning and Architecture, Vijayawada

The following internal members from Office of Dean academics were invited

1. Dr.K.Tirupati Rao (Additional Dean (Academics)
2. Dr. V.N. Sailaja, (Associate Dean (Academics)
3. Dr. N.V.K. Ramesh (Associate Dean (Academics)

Members Absent:

1. None


Ar. A. Priya,
MOD-ARCH, KLEF,



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Leave of absence: The following members were granted leave of absence.

1. None

Webex meeting Link:

<https://kluniversity.webex.com/meet/cr122>

Discussion on Agenda Items: To discuss all the DAC 14 points and get approval / review on the same

Agenda 1: Summary of Stakeholders feedback and Action taken report

Conclusion: As per the stakeholder feedback, the following have been proposed.

S.no	Comments of the stakeholders on curriculum	Action taken on the feedback received	Review and approval status in BOS
1a.	Academic peer: RAJEEV SHARMA, ASSISTANT PROFESSOR, AIT-SAP, Greater Noida Electives related to digital architecture, automation, artificial intelligence, and 3d printing should be added as a part of a syllabus.	School of architecture is formulating certificate/ core courses in coordination with CSE department on AI, and other related courses. The status of this process will be updated in follow up meeting	In addition to certificate and core course it should be added as elective as well
1b.	Alumni: Mynam Divya Tejaswi: Weightage of computer studio to be increased	One more computer studio will be included. The syllabus of the 3 computer studios to be revised by the faculty.	Photoshop is basic and Rhino can be added in computer studio II
1c	Academic peers Neeraj Kumar, Associate Professor, Gateway College of Architecture	A revised curriculum has been submitted to the DAC Committee. The revision of the curriculum is under	The course name can be revised as Design of Structure and the revised syllabus is approved in BOS. The reference sections should contain IS Codes.



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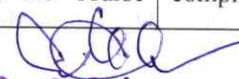
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	and Design, Sonipat, Haryana: The course curriculum for MOS and DOS are not oriented towards architecture.	process and will be updated in follow up meeting.	
ld	Suggestion to add one more Architectural Drawing studio in addition to AD1 and AD 2	All the DAC members disagreed to this suggestion. The syllabus for AD1 and AD 2 is sufficient.	The decision taken in DAC is ratified
le	Electives could be changed or altered from time to time on need basis.	Electives are per COA norms and revised time to time.	The decision taken in DAC is ratified
lf	Industry personnel: Ar. Hriday Siddharth, Architect, Archi Wing Studio, India: Inclusion of BIM software in course curriculum	BIM will be introduced in Computer Studio 3 which has been proposed in point 1b.	BOS member felt that introducing BIM in 3 rd year is too early. It should be included in 4 th year syllabus
lg	B. R. L. V. Pravallika: The alumni suggested to make the course more industry oriented and create channel for communication with other institutions and industry people.	DAC members suggested to have 2 weeks induction programme in both the semesters in first year where students can be oriented towards the subject by visiting architects' offices and their projects.	In addition to this BOS members suggested every year should have at least one week industry orientation programme
lh	Vidya Sagar Reddy G (Emp Id 4214): Building Services III & IV syllabus is too exhaustive. Submission	The committee members agreed to rearrange the Building Services courses in BS I to III without compromising the course	BOS member felt that consolidating 4 Building services in 3 semesters is not a good idea. BS III can contain HVAC completely. BS I will have


Ar. A. Priya,
HOD-ARCH, KLEF.



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	is to squeeze Building services I-IV to Building Services I-III & add AI / UI course which adds value for student placements.	content. There was repetition in the course content which will be removed. The final syllabus will be submitted in the follow up meeting after capturing the comments given by the DAC members.	plumbing. The other subjects can be distributed in other two semesters.
1j	Tanushree Das (7015): More research-oriented subjects like Seminar can be introduced from 3rd year level.	Members of the committee felt that introducing a theory subject for Research Methodology is not required at bachelors' level. However, the methodology can be included in one CO of Dissertation/ Pre – thesis	BOS members strongly felt that there should be one theory subjects for research methodology as the component of research n architecture education is increasing

Agenda 2: Proposal for inclusion of “**Building bye laws and office management**” in 3rd year as current professional Practice syllabus does not cover building bye laws completely

Conclusion in DAC: The portions which contain “Building bye laws” in “Professional Practice” will be removed and “**Building bye laws and office management**” will be introduced as new course. The syllabus of the same from Y 2015- 2016 Curriculum will be adapted.

Decision taken in BOS

The BOS members strongly suggested to have **Building bye laws and office management** as a separate course. **ECBC** has been suggested to be included in CO3 of the proposed syllabus

Agenda 3: Proposal for combining Sustainable I(22AR3117B) and Sustainable II (22AR3221B) in one subject and in place of sustainable II and inclusion of simulation software in the course curriculum

Conclusion: There is repetition in the Sustainable Architecture I and Sustainable Architecture II syllabus. Both the courses will be combined as Sustainable Architecture. The faculty has proposed a new syllabus for the same which will be approved in the follow up meeting after review.



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Decision taken in BOS

The BOS members approved the above point. In addition to that it was advised to add energy modelling and energy audit in the CO4 of Sustainable Architecture curriculum

Agenda 4: Improvement of the course contents of the following courses

4.1 Building Materials, I and II (22AR1103, 22AR1206)

Decision taken in BOS

BOS members suggested to add the following topics in the Building Material curriculum

Modern materials like PU, Foam, fly ash bricks etc to be included

Market survey should be mandatorily added in one CO

4.2 Building Constructions, I and II (22AR2137, 22AR2240)

Decision taken in BOS

BOS members suggested to add the following topics in the Building Construction curriculum

Light weight wall constructions, fly ash brick masonry shall be included in Building construction I

Scaffolding, shoring, trenching to be added in Building Construction II

In place of timber trusses, Tubular trusses to be added in Building Construction II

4.3 Housing (22AR4126A)

Decision taken in BOS

Discussion on Affordable housing should be given importance

4.4 Urban Design (22AR4229A)


Decision taken in BOS

The revised syllabus was approved by BOS members

4.5 Human settlement and planning (22AR3220)

Decision taken in BOS

The revised syllabus was approved by BOS members



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4.6 Behavioural Architecture (22AR4227A)

Decision taken in BOS

User experience (UX), AR and VR to be added in CO1

4.7 Advanced Building Techniques (22AR4125 A)

Decision taken in BOS

Building automation, Dynamic façade, Tubular structures, structures for high rise buildings, PTFE as building materials to be added

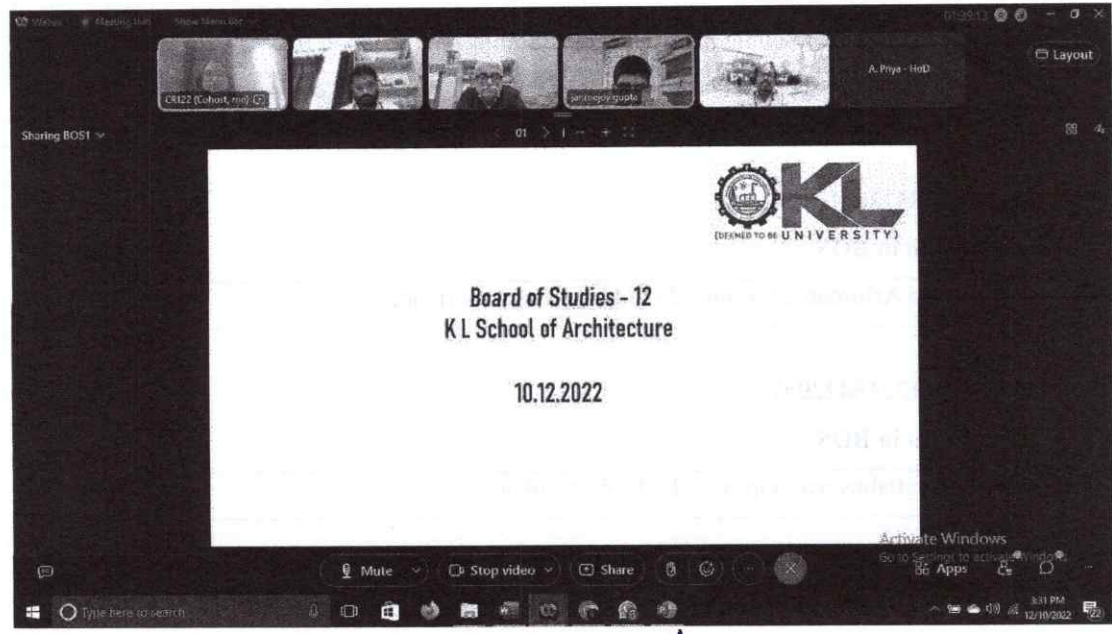
Prefab structures to be added in CO1

Agenda 5: To approve the course structure of 2nd, 3rd, 4th, and 5th year of Y 22 regulation

Decision taken in BOS

The Y 22 course structure for 2nd, 3rd, 4th, 5th year was approved. There is no change in the syllabus from regulation Y 21

Images of the online meeting



(Handwritten Signature)
Dr. A. Priya,
HOD-ARCH, KLEF.

DR. A. PRIYA
 HOD-ARCH, KLEF



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DAC Agenda no	Stakeholders' comments	Action taken on the feedback received	Existing syllabus	Proposed syllabus
1e	Electives could be changed or altered from time to time on need basis.	Electives are per COA norms and revised time to time.		
1f	Inclusion of BIM software in course curriculum	BIM will be introduced in Computer Studio 3 which has been proposed in point 1b.		
1g	The alumni suggested to make the course more industry oriented and create channel for communication with other institutions and industry people.	DAC members suggested to have 2 weeks induction programme in both the semesters in first year where students can be oriented towards the subject by visiting architects' offices and their projects.		

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Participants (6):
A Priya - Host
CR122 - Host
CR122 - Guest
ASHOK GROVER
CR 121
jennjoy gupta

Webex meeting recording:

CLASSROOM 122's Personal Room-20221210 0838-1

Password: wNw33TFT

Recording link:

<https://kluniversity.webex.com/kluniversity/ldr.php?RCID=5ad4affc1b81d4435851aaa74c73020d>

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A. Priya
Head of the Department
K.L - School of Architecture



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List of attendees:

S. No	Name	Designation	Signature
1	Ar. Venkatesan Selvaraj	Principal, DAC chairman	
2	Ar. A. Priya	H.O. D	
3	Ar. Kiran Kumar Bonda	Dy. H.O. D and NAAC In charge	
4.	Ar. Tanushree Das	Associate Professor, Academic In charge	Tanushree Das
5	Ar. Ashok Grover	Principal architect: Ashok Grover & Associates	online presence.
6	Dr. (Prof.) Janmejoy Gupta	Associate Professor and Dean - Research	online presence.



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Annexure 1:

Reference Annexure for Program Structures and Syllabus Revision

1. Program structure (with all Courses) 2023-24

SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
1	23AR1101	Theory of Architecture	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
2	23AR1102	History of Architecture - I	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
3	23AR1103	Building Materials - I	BSAE	2	0	0	0	2	2	Nil	Revised course	B.V. Lakshmi	Employability	Feedback from faculty
4	23AR1151	Art and Visual Graphic Studio	SEC	0	0	6	0	6	3	Nil	Retained course	-	Skill development	-
5	23AR1152	Architectural Drawing - I	PC	0	0	6	0	6	3	Nil	Retained course	-	Skill development	-
6	23AR1153	Architectural Design Studio - 1 (Basic Design)	PC	0	8	0	0	8	12	Nil	Retained course	-	Entrepreneurship	-
7	22UC1101	Integrated Professional English	OE	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
8	20UC0009	Ecology & Environment	BSAE	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
9	23AR1204	Design of Structures - I	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
10	23AR1205	History of Architecture - II	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
11	23AR1206	Building Materials - II	BSAE	2	0	0	0	2	2	Nil	Revised course	B.V. Lakshmi	Employability	Feedback from faculty
12	23AR1254	Model Making Workshop	PC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-

Ar. A. Priya

Head of the Department

School of Architecture



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13	23AR1255	Architectural Drawing - II	PC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
14	23AR1256	Architectural Design Studio -II	PC	0	8	0	0	8	12	23AR1153	Retained course	-	Entrepreneurship	-
15	22UC1202	English Proficiency	OE	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
16	23AR2107	Design of Structures - II	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
18	23AR2108	History of Architecture - III	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
19	23AR2109	Climate Responsive Architecture	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
20	23AR2110	Surveying and Levelling	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
21	23AR2157	Computer Studio - I	SEC	0	0	4	0	4	2	Nil	Revised course	G. Vidya Sagar	Skill development	Feedback from students and industry experts
17	23AR2158	Building Construction - I	BSAE	0	4	0	0	4	6	Nil	Revised course	B.V. Lakshmi	Employability	Feedback from faculty
22	23AR2159	Architectural Design Studio -III	PC	0	8	0	0	8	12	23AR1256	Retained course	-	Entrepreneurship	-
23	20UC2103	Design Thinking and Innovation	UC	1	0	0	4	2	2	Nil	Retained course	-	Entrepreneurship	-
24	23AR2211	Design of Structures - III	BSAE	3	0	0	0	3	3	Nil	Revised course	Academic Peers	Employability	Syllabus not suitable for architects
25	23AR2212	Building Services - I	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
26	23AR2260	Building Construction - II	BSAE	0	4	0	0	4	6	Nil	Revised course	B.V. Lakshmi	Employability	Feedback from faculty

Ar. A. Priya

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27	23AR2213	Site Analysis and Planning	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
28	23AR2261	Architectural Design Studio -IV	PC	0	8	0	0	8	12	23AR2159	Retained course	-	Entrepreneurship	-
29	23AR2214	Contemporary Indian Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
30	23AR2262	Computer Studio - II	SEC	0	0	4	0	4	2	Nil	Revised course	G. Vidya Sagar	Skill development	Feedback from students and industry experts
31	23AR3115	Design of Structures - IV	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
32	23AR3116	Building Services - II	BSAE	3	0	0	0	3	3	Nil	Revised course	G. Vidya Sagar	Employability	Feedback from faculty
33	23AR3163	Building Construction - III	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-
34	23AR3117	Building Bye laws and Office Management	PC	2	0	0	0	2	2	Nil	New Course	A. Priya	Entrepreneurship	Feedback from faculty
35	22AR3164	Architectural Design Studio -V	PC	0	8	0	0	8	12	23AR2261	Retained course	-	Entrepreneurship	-
36	22AR3118A	Interior Design Studio	PE	0	0	4	0	4	2	Nil	Retained course	-	Entrepreneurship	-
37	22AR3118B	Furniture Design Studio									Retained course	-	Entrepreneurship	-
38	22AR3119	Contemporary Western Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
39	23AR3165	Computer Studio - III	SEC	0	0	4	0	4	2	Nil	New Course	G. Vidya Sagar	Skill development	Feedback from students and industry experts
40	23AR3120A	Vernacular Architecture	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
41	23AR3120B	Sustainable Architecture									Revised course	Harshita	Employability	Feedback from faculty

Ar. A. Priya

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42	23AR3221	Building Services - III	BSAE	3	0	0	0	3	3	Nil	Revised course	G. Vidya Sagar	Employability	Feedback from faculty
43	23AR3266	Building Construction - IV	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-
44	23AR3222	Specification, Estimation and Costing	PC	3	0	0	0	3	3	Nil	Retained course	-	Skill development	-
45	23AR3223	Human Settlements and Planning	PC	2	0	0	0	2	2	Nil	Revised course	B. Kiran Kumar	Employability	Feedback from faculty
46	23AR3224A	Landscape Design Studio	PE	0	0	4	0	4	2	Nil	Retained course	-	Entrepreneurship	-
47	23AR3224B	Modular Construction Studio								Nil	Retained course	-	Entrepreneurship	-
48	23AR3267	Architectural Design Studio -VI	PC	0	8	0	0	10	12	22AR3164	Retained course	-	Entrepreneurship	-
49	23AR3225A	Appropriate Construction Technologies	PE	2	0	0	0	2	2	Nil	Revised course	BOS	Employability	Feedback from faculty
50	23AR3225B	Energy Efficient Building									New Course	BOS	Employability	BOS external expert's suggestion
51	20BB21C3	Human Resource Management	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
52	23AR4126	Building Services - IV	BSAE	3	0	0	0	3	3	Nil	Revised course	G. Vidya Sagar	Employability	Feedback from faculty
53	23AR4127A	Advanced Building Techniques	PE	0	0	4	0	2	2	Nil	Revised course	BOS	Employability	BOS external expert's suggestion
54	23AR4127B	Architecture Photography								Nil	Retained course	-	Skill development	-
55	23AR4128A	Housing	PE	2	0	0	0	2	2	Nil	Revised course	B. Kiran Kumar	Employability	Feedback from faculty
56	23AR4128B	Intelligent Buildings								Nil	Retained course	-	Employability	-
57	23AR4168	Architectural Design Studio - VII	PC	0	10	0	0	10	15	23AR3267	Retained course	-	Entrepreneurship	-

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SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
58	23AR4129A	Architectural Conservation	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
59	23AR4129B	Set Design									Retained course	-	Skill development	-
60	23AR4130	Working Drawing - I	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
61	23AR4131	Research Methodology	PC	2	0	0	0	0	0	Nil	New Course	Tanushree	Employability	BOS external expert's suggestion
62	23AR4232	Building Construction and Management	PAECC	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
63	23AR4269A	Dissertation	PE	0	4	0	0	4	6	Nil	Retained course	-	Skill development	-
64	23AR4269B	Thesis Seminar								Nil	Retained course	-	Skill development	-
65	23AR4233A	Urban Design	PE	2	0	0	0	2	2	Nil	Revised course	B. Kiran Kumar	Employability	Feedback from faculty
66	23AR4233B	Transportation Planning								Nil	Retained course	-	Employability	-
67	23AR4270	Urban Design Studio	PC	0	8	0	0	8	12	23AR4168	Retained course	-	Entrepreneurship	-
68	23AR4234A	Behavioral Architecture	PE	3	0	0	0	3	3	Nil	Revised course	P. Senthil	Employability	Feedback from faculty
69	23AR4234B	Disaster Mitigation and Management									Retained course	-	Employability	-
70	23AR4271	Working Drawing - II	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
71	23AR5172	Practical Training / Internship	PAECC	0	0	40	0	40	20	23AR4270	Retained course	-	Employability	-
72	23AR5235	Architecture Professional Practice	PAECC	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
73	23AR5273	Architectural Thesis	PC	0	12	0	0	12	18	23AR5172	Retained course	-	Entrepreneurship	-
									280					

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Percentage of Syllabus Revision = 30%

Percentage of Courses focusing on Employability = 53 %

Percentage of Courses focusing on Entrepreneurship = 23 %

Percentage of Courses focusing on Skill Development = 24 %

Ar. A. Priya

Head of the Department

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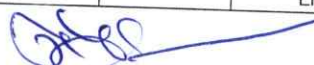
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Annexure 3: Reference Annexure for Program Structures and Syllabus Revision

Program structure (from 2nd year to 5th year) 2022-23

SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
1	22AR2107	Mechanics of Structures - II	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
2	22AR2137	Building Construction - I	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-
3	22AR2108	History of Architecture - III	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
4	22AR2109	Climate Responsive Architecture	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
5	22AR2135	Surveying and Levelling	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
6	22AR2136	Computer Studio - I	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
7	22AR2138	Architectural Design Studio -III	PC	0	8	0	0	8	12	22AR1257	Retained course	-	Entrepreneurship	-
8	21UC2103	Design Thinking and Innovation -	UC	1	0	0	4	2	2	Nil	Retained course	-	Skill development	-
9	22AR2210	Design of Structures - I	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
10	22AR2211	Building Services - I	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
11	22AR2240	Building Construction - II	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-


Ar. A. Priya
 Head of the Department
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SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
12	22AR2212	Site Analysis and Planning	PC	2	0	0	0	2	2	Nil	Retained course	-	Skill development	-
13	22AR2241	Architectural Design Studio -IV	PC	0	8	0	0	8	12	22AR2138	Retained course	-	Skill development	-
14	22AR2213	Contemporary Indian Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Entrepreneurship	-
15	22AR2239	Computer Studio - II	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
16	22AR3114	Design of Structures - II	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
18	22AR3115	Building Services - II	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
19	22AR3143	Building Construction - III	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-
20	22AR3144	Architectural Design Studio -V	PC	0	8	0	0	8	12	22AR2241	Retained course	-	Skill development	-
21	22AR3118A	Interior Design Studio	PE	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
17	22AR3118B	Furniture Design Studio									Retained course	-	Employability	-
22	22AR3116	Contemporary Western Architecture	PC	2	0	0	0	2	2	Nil	Retained course	-	Entrepreneurship	-
23	22AR3117A	Vernacular Architecture	PE	2	0	0	0	2	2	Nil	Retained course	-	Entrepreneurship	-
24	22AR3117B	Sustainable Architecture - I									Retained course	-	Employability	-

Ar. A. Priya

Head of the Department

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SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
25	22AR3219	Building Services - III	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
26	22AR3246	Building Construction - IV	BSAE	0	4	0	0	4	6	Nil	Retained course	-	Employability	-
27	22AR3218	Specification, Estimation and Costing	PC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
28	22AR3220	Human Settlements and Planning	PC	2	0	0	0	2	2	Nil	Retained course	-	Entrepreneurship	-
29	22AR3222A	Landscape Design Studio	PE	0	0	4	0	4	2	Nil	Retained course	-	Employability	-
30	22AR3222B	Modular Construction Studio								Nil	Retained course	-	Skill development	-
31	22AR3247	Architectural Design Studio -VI	PC	0	8	0	0	10	12	22AR3144	Retained course	-	Employability	-
32	22AR3221A	Appropriate Construction Technologies	PE	2	0	0	0	2	2	Nil	Retained course	-	Employability	-
33	22AR3221B	Sustainable Architecture - II									Retained course	-	Employability	-
34	20BB21C3	Human Resource Management	OE	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
35	22BB32C3	Innovation and Entrepreneurship	OE							Nil	Retained course	-	Entrepreneurship	-

Ar. A. Priya

Head of the Department
K.L - School of Architecture



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SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
36	22AR4123	Building Services - IV	BSAE	3	0	0	0	3	3	Nil	Retained course	-	Entrepreneurship	-
37	22AR4125A	Advanced Building Techniques	PE	0	0	4	0	2	2	Nil	Retained course	-	Entrepreneurship	-
38	22AR4125B	Architecture Photography								Nil	Retained course	-	Employability	-
39	22AR4126A	Housing	PE	2	0	0	0	2	2	Nil	Retained course	-	Skill development	-
40	22AR4126B	Intelligent Buildings								Nil	Retained course	-	Employability	-
41	22AR4150	Architectural Design Studio -VII	PC	0	10	0	0	10	15	22AR3247	Retained course	-	Employability	-
42	22AR4124A	Architectural Conservation	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
43	22AR4124B	Set Design									Retained course	-	Employability	-
44	22AR4148	Working Drawing - I	SEC	0	0	4	0	4	2	Nil	Retained course	-	Skill development	-
45	22AR4226	Building Construction and Management	PAECC	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
46	22AR4228A	Dissertation	PE	0	4	0	0	4	6	Nil	Retained course	-	Entrepreneurship	-
47	22AR4228B	Thesis Seminar								Nil	Retained course	-	Entrepreneurship	-
48	22AR4229A	Urban Design	PE	2	0	0	0	2	2	Nil	Retained course	-	Entrepreneurship	-
49	22AR4229B	Transportation Planning	PC	0	8	0	0	8	12	Nil	Retained course	-	Employability	-
50	22AR4253	Urban Design Studio								22AR4150	Retained course	-	Employability	-


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SNO	COURSE CODE	COURSE NAME	Type	L	T	P	S	CH	CR	Prerequisites	New Course/ Revised Course/ Retained Course	Changes Proposed by	Focused on Employability/ Entrepreneurship/ Skill Development	Justification
51	22AR4227A	Behavioral Architecture	PE	3	0	0	0	3	3	Nil	Retained course	-	Employability	-
52	22AR4227B	Disaster Mitigation and Management								Nil	Retained course	-		
53	22AR4251	Working Drawing - II	SEC	0	0	4	0	4	2	Nil	Retained course	-	Employability	-

Percentage of Syllabus Revision = 0.0 %

Ar. A. Priya

Head of the Department

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Annexure 2: Revised syllabus as approved by BOS experts

23 AR 1103: Building Material I

L-T-P-S: 2-0-0-0

Credit: 2

Prerequisite: Nil

Mapping of Course Outcomes

CO	Course Outcome	PO/PSO	BTL
CO1	Understanding of the building materials -Soils and Bricks	PO1	2
CO2	Understanding of the building materials -stones & sand	PO1	2
CO3	Understanding of the building materials Lime and Cement	PO1	2
CO4	Understanding of the building materials- Timber & Bamboo	PO1	2

Properties and behaviour of both natural and man-made building materials such as bricks, stones, clay, timber, bamboo, lime& cement; Application of these materials in construction; Effects of sun, rain, wind, and other climatic and environmental conditions on various building materials and built environment etc.

Syllabus:

CO1: SOILS & BRICKS

Soils: Fundamentals about soil and it's uses, formation of soil, components and properties of soil, soil structure, classification, and study of the major types of soils in India.

Bricks: Composition of good brick, various stages of manufacturing processes of bricks, properties and uses of bricks, classification of bricks, requirements and tests for good bricks, shapes of bricks, firebricks, and substitutes for bricks. Clay products: Tiles, terra cotta, stoneware, earthenware, porcelain, and clay blocks, their properties and uses.

CO2: STONES & SAND:

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

Sand: Study of sands like pit, river and sea sand, Types and properties of sands used in building construction, impurities and removal of silt and organic matter, bulking of sand, different grades of sand with respective to size and applications Standards, use in mortar and concrete.

CO3: LIME&CEMENT:

Lime: Ingredients and manufacturing of lime, classification of limes, properties, and uses of various types of limes, Lime mortar and surkhi.

Cement: Ingredients and manufacturing of cement, classification of cements, properties, and uses of various types of cements and its application in building industry.

CO4: TIMBER &BAMBOO:


Ar. A. Priya

Ar. A. Priya
 Head of the Department
 School of Architecture



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Timber: Classification of trees, structure of trees, Storage of timber, Uses of timber, characteristics, seasoning of timber, Defects, diseases and decay of timber, Preservation, Fire resistance, Conservation of timber and processed woods.

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

Textbooks:

1. Don A. Watson, "Construction Materials and Processes", McGraw Hill, 1972.
2. W.B. McKay, "Building Construction", Vol, 1 and 2, Longmans, UK, 1981.
3. S.C Rangwala "Building Construction", Charotar Publishing House, India, 2000.
4. S.K.Sharma, "A Text book of Building Construction", Chand & Co Ltd., New Delhi, 1998.

Reference Books:

1. American Institute of Timber Construction (AITC), "Timber Construction Manual", Wiley Publishers, 2004.
2. Francis D.K Ching "Building Construction" illustrated, John Willey & Sons, 2008.
3. Barry, "Construction of Buildings", Volume 1&2, Blackwell Publishing Ltd., Oxford, 2005.
4. Wills H Wagner, Howard Bud, "Modern Carpentry", Good Heart – Wilcox publishers, Portland, 2003

23 AR 1206: Building Material II

L-T-P-S: 2-0-0-0

Credit: 2

Prerequisite: Nil

Mapping of Course Outcomes


CO	Course Outcome	PO/PSO	BTL
CO1	Understanding the building materials -Ferrous &Nonferrous metals	PO1	2
CO2	Understanding of the building materials – Cement mortar and concrete & Reinforced cement concrete.	PO1	2
CO3	Understanding of the building material - Glass.	PO1	2
CO4	Understanding of the building material - Paints.	PO1	2

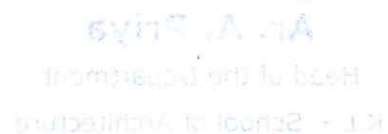
Properties and behaviour of both natural and man-made building materials such as metals, glass, steel and finishing materials in contemporary buildings; Application of these materials in construction; Effects of sun, rain, wind, and other climatic and environmental conditions on various building materials and built environment and the science of design for creating effective human comfort conditions within the built environment.

Syllabus:

CO1: FERROUS & NON-FERROUS METALS

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Ar. A. Priya
Head of the Department
K.L - School of Architecture





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FERROUS METALS: Properties and uses of cast iron, wrought iron, pig iron and steel. Market forms of steel: structural steel, stainless steel, steel alloys –Their application in building industry.

NON-FERROUS METALS –: Properties and uses of aluminum, zinc, lead, copper etc., Their application in building industry.

CO2: CEMENT MORTAR AND CONCRETE & R.C.C

CEMENT MORTAR AND CONCRETE: Introduction to Cement mortar and concrete and its constituents and aggregates; Properties and uses, methods of preparation & handling. Study and application of different mortars and concretes. Grading: Importance, fineness modulus, water cement ratio, mixing, placing, and curing.

REINFORCED CEMENT CONCRETE:

Introduction to R, C.C and its constituents and aggregates; Properties and uses, methods of preparation & handling. Study and application of different types of R.C.C.

CO3: GLASS

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

CO4: PAINTING, VARNISHING & MISCELLANEOUS MATERIALS:

Painting: Characteristic of an ideal paint, types of paints, defects in painting, painting on different surfaces. **Varnishing:** Varnish types, Process of varnishing. Miscellaneous materials like Epoxy, Melamine, Putty, Foams, Bitumen etc.,

Textbooks:

1. S.C.Rangwala, "Engineering Materials", Charotar Publishing House, India, 1997.
2. S.K Duggal, "Building Materials", Oxford and IBM Publishing Co, Pvt. Ltd., 1997.
3. P.C Varghese, "Building Materials", Prentice Hall of India Pvt. Ltd., New Delhi, 2005

Reference Book:

1. Arthur Lyons, "Materials for Architects and Builders", An introduction Arnold, London, 1997.
2. Don A.Watson, "Construction Materials and Processes", McGraw Hill Co., 1986.
3. S.N Sinha, "Reinforced Concrete Design", Tata-McGraw Hill, New Delhi, 2002
4. Howard Kent Preston, "Prestressed concrete for Architects and Engineers", McGraw Hill, New York, 1964

Ar. A. Priya

Head of the Department
K.L - School of Architecture

At. A. Davis
Head of the Department
of Education, Albany, N. Y.



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

CO4

Brick, Stone Masonry & different types of masonry systems:

Applications of brick masonry: Foundation, walling, types of brick walls, brick masonry (English, Flemish, rat trap bond) detailed brick layout at corners, junctions and brick piers, style of construction viz., exposed brick work, Reinforced brick walls, piers etc.

Brick Roofing: Types of brick roofs, Madras terrace roof, jack arch roof, brick arches and domes, reinforced brick roofs, Types of arches, vaults and domes, and construction of arches, vaults, and domes. Application of stone masonry: Foundation walling, types of different stone masonry (rubble & ashlar masonry), stone piers, arches, facing or cladding stone systems & composite masonry

Textbooks:

1. Harold B.Olin – Construction principles, Materials and Methods – IFE, Chicago, 1980.
2. Dr. B.C Punmia – Building construction
3. R. Chudley, construction Technology.

22AR2260: Building Construction- II

L-T-P-S: 0-4 -0-0

Credits: 6

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO	Course Outcome	PO/PSO	BTL
CO1	To Understand the construction of doors and windows in accordance with the type of	PO1, PO3	2
CO2	To understand the uses of wooden trusses and staircases in construction industry/practice	PO1, PO3	2
CO3	To understand the installation of paneling, soundproof and lightweight partitions	PO3	2
CO4	To understand the techniques of bamboo constructions and the construction techniques of wall and kitchen cabinets	PO3	2

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22AR2137: Building Construction- I

L-T-P-S: 0-4 -0-0

Credits: 6

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO	Course Outcome	PO/PSO	BTL
CO1	to understand natural materials like stone used in the building construction, method of construction and its application & usage in building industry & types of masonry, it's systems & techniques.	PO6,	2
CO2	To understand the brick as basic building material & application of clay products in construction sector, methods & techniques.	PO6	2
CO3	To understand the basic building components of the building i.e.: Foundation to parapet wall. To study the elements of the building and their importance, to understand the sequences of construction & structural system.	PO6	4
CO4	Students should be able to analyze the different types of brick masonry & construction methods and details of contemporary and traditional work method demonstrate the techniques through study models	PO6	4

Course outcome

Traditional and conventional knowledge systems that enable construction of a complete building; various structural systems and methods of construction and detailing of buildings of medium complexity using natural and manmade materials including foundation, walls, roofs, staircase, joinery, and finishes. The course will combine lecture and studio exercises whose results will be in the form of drawings and models, culminating in a studio which will translate an architectural design into working drawings which are good for construction in manual/ digital mode.

Syllabus:

CO1

Stones: Geological Classification of rocks – test for stones, uses of stones, deterioration of stone, preservation of stones, stones available for construction in India their properties and uses. Stones for finishes – cutting & polishing – granite and marble. Artificial stone and their uses & types of stone masonry.

CO2

Bricks & Clay Products:

Bricks: Composition of good brick, properties and uses of bricks, classification of bricks, shape of bricks, fire bricks, and substitutes for bricks Clay products: Tiles, terra cotta, stoneware, earthenware, porcelain, and clay block their properties and uses, types of masonry systems.

CO3

Basic Building Components, Foundation, Walls & roofs:

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Showcase and Shelf: Methods of making the TV Shelf, showcase and dressing wardrobe. Cupboard & cabinet: kitchen cupboards and wall cabinets showing the details of joinery and material finishes

23AR1204: Structural Design - I

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Familiarize the students about the architecture and structural engineering interface. Understanding the concept of forces and structural systems.	PO1	2
CO2	Analysing the plane trusses	PO3	2
CO3	Understanding of shear force and bending moments in column. Determination of deflection of beams	PO3	4
CO4	Understanding of centre of gravity and moments of inertia and its impact on the structures.	PO3	4

Syllabus:

CO1: Introduction to Forces and Structural Systems:

Process of building structures. Broad categorization of structural systems. Basic requirements of structure. Force and its units, Laws of forces, Resultant of a Force System, Law of Inertia, Law of action and reaction, Free body diagram, Static equilibrium & conditions of equilibrium, conditions of statically determinacy, Degree of Indeterminacy. Types of supports and support reactions, Determination of support reactions for statically determinate structures, Analysis of forces, moments, and couples in structures.

CO2: Analysis of a perfect truss by method of joints and method of sections. Simple stress and strains, elastic constants, stress strain curves, relationship among elastic constants. Study of beams with different types of support conditions and different types of loadings. BIS 875 code for estimation of design loads in a building.

CO3: Shear force and shear force diagrams, bending moment & Bending moment diagrams for determinate beams, Sagging and Hogging Bending Moments, Sign Convention, Point of contraflexure and determination of its location. Flexural and shear stresses under bending, Determination of deflection in the beams (only formulae to be told, no derivation) Deflected shapes of the beams.

CO4: Centre of Gravity and Centroid and its determination for a plane lamina. Moment of Inertia and its determination for a plane lamina, Parallel Axis theorem and Perpendicular Axis theorem.

Textbook:

1. Bansal R.K. – A textbook on Engineering Mechanics, Laxmi Publications, Delhi, 2005.
2. Bansal R.K. – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

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Course Outcomes

Traditional and conventional systems that enable construction of a complete building components; various components like doors, windows, paneling, partitions, staircase and trusses, and methods of construction and detailing of buildings of medium complexity using natural and manmade materials doors, windows, roofs, staircase & partitions showing the details of joinery and material finishes; To explore the students about the construction of contemporary buildings using various vernacular and contemporary structural systems and materials. The course will combine lecture and studio exercises whose results will be in the form drawings and models, culminating in a studio which will translate an architectural design into working drawings which are good for construction in manual mode.

Syllabus:

CO1

Timber-Joinery: Methods of construction using natural timber in joinery works including methods of fixing and options for finishing of doors & windows-terms associated & positioning. Windows (paneled, louvered, glazed and sliding windows) - Doors (paneled, glazed, sliding, sliding/folding, louvered and pivoted) – Ventilators (top hung, bottom hung, pivoted, louvered, and glazed.

CO2 :

Floors, Trusses, and Staircases: Methods of construction using natural timber in various structural components of the building such as floors, walls, and roof trusses - Exercises involving the above through case studies - Types of timber staircases. Methods of making wooden floors different types of trusses Methods of construction of timber staircases- Basic principles and design details including detailing of handrail and baluster- Exercises involving the above through drawings.

CO3:

Partitions and Paneling: Methods of construction using man-made timber products such as ply woods, block boards, MDF, etc., in fixed partition, sliding/folding partitions, wall paneling. - Exercises of the above through drawings and case studies.

CO4:

Bamboo and Other Materials: Design and Construction Techniques using bamboo for building components for small scale buildings likesnack bar, tree house including detailing of doors and windows, arches, barrel walls, weave structures and understanding of the same through case studies Cane, gate, coir, coconut - Growth, Form, Shape, Roofing materials – Thatch, grass, Bamboo, reeds – Basics – Case studies and applications.

Furniture and Fitments

Ar. A. Priya

Head of the Department

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Ar. A. Priya
Head of the Department



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1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.
3. Nash W.A., "Strength of Materials" – Schaums Series, McGraw Hill Book Company, 1989.
4. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.

22AR2107: Structural Design - II

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understanding the concept of simple stresses and strains and elastic properties of solids	PO2	2
CO2	Understanding the properties of structural timber and bamboo	PO2	4
CO3	Design of flexure members of timber and design of simple truss.	PO3	4
CO4	Structural properties of brick masonry and analysis	PO3	2

Syllabus:

CO1: Simple Stresses and Strains: Introduction to structural elements. Types of engineering materials, their mechanical properties, and the tests for determination of the same. Study of a section subjected to pure bending, Neutral Axis, Moment of Resistance and Section Modulus. Stress and Strains; stress strain diagram for mild steel and high tensile steel and concrete Elastic constants and their mutual relationships; Simple redundant problems of stresses and strains.

CO2: Properties of Structural Timber, Defects of timber and their impact on structural properties of timber, permissible stresses in timbers and modification factors. Classification of timber, Introduction to IS Code of Timber Construction – IS: 883. Introduction to Bamboo as structural material

CO3: Analysis and Design of flexural members of timber. Built up beams and flitched beams. Analysis and Design of timber columns; Solid columns and built-up columns. Design of members of a simple truss.

CO4: Brick as a structural material, Design of a load bearing brick wall and wall footing. Types of masonry used as structural system for building structures. Structural properties of brick masonry and analysis and design of low-rise masonry buildings including masonry foundation

Textbook:

1. Bansal R.K. – A textbook on Engineering Mechanics, Lakshmi Publications, Delhi, 2005.
2. Bansal R.K. – A textbook on Strength of Materials, Lakshmi Publications, Delhi 2007.

References:

1. Punmia P.C., "Strength of Materials and Theory of Structures"; Vol. I, Lakmi Publications, Delhi 1994.
2. Ramamrutham S., "Strength of Materials", Dhanpatrai & Sons, Delhi, 1990.

Ar. A. Priya

Head of the Department

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3. Nash W.A., "Strength of Materials" – Schaums Series, McGraw Hill Book Company, 1989.
4. Rajput R.K., "Strength of Materials", S. Chand & Company Ltd., New Delhi, 1996.

22AR2211: Structural Design III

L-T-P-S: 3-0 -0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understanding of Basics of RCC design	PO1, PO3	3
CO2	Understanding and designing of columns	PO1, PO3	3
CO3	Understanding and designing of footings and staircases	PO1, PO3	3
CO4	Understanding and analysis a given section for under or over design and load carrying capacity	PO1, PO3	3

Syllabus:

CO1: History of reinforced concrete structures and philosophy of limit state design Understanding the codal provision. Analysis and design of reinforced concrete beams, slabs.

CO2: Introduction to columns: short columns, slender columns, uni-axial behavior, and bi-axial behavior. Designing the same.

CO3: Introduction to types of footings and analyzing and designing the isolated footing with axial load and moment. Introduction to the types of staircases and analyzing and designing the dog legged staircase.

CO4: Under Reinforced, Balanced and Over-Reinforced sections: Formulation, Analysis of a given section and determination of moment of resistance/load carrying capacity. Design under shear, bond and development length, Analysis & Design of a doubly reinforced RC beam, Continuous and Cantilever Beams.

Textbook:

1. M.R. Shiyekar, "Limit State Design in Structural Steel", PHI Learning Private Limited, 2010.
2. N. Subramanian, "Design of Steel Structures", Oxford Higher Education, 2008.

References:

1. S.K. Duggal, "Limit State Design of Steel Structures", McGraw Hill Education, Private Limited, 2010.
2. Dr. V. L. Shah, Prof. Veena Gore, "Structures Publications", Pune, 2012.
3. S.S. Bhavikatti, "Design of Steel Structures" by Limit State Method as per IS800-2007, I.K. International Publishing House Pvt, Ltd, 2012.

Ar. A. Priya
Head of the Department
K.L - School of Architecture

Ar. A. Priya
Head of the Department
K.L - School of Architecture



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22AR3115: Structural Design IV
L-T-P-S: 3-0-0-0 Credits: 3 Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understanding of limit state design.	PO2	2
CO2	Analysis and Design of reinforcement for a section	PO2	3
CO3	Design & detailing of one way and two-way slab.	PO3	3
CO4	Detailing for special structures such as deep beams, corbels, shear walls etc.	PO3	3

Syllabus:

CO1: Introduction, general requirements for structural detailing in concrete, simple theory, steel for reinforcement, general rules for detailing. Concept of Limit state Design, Characteristic strength of steel and concrete, Loads and Loading conditions, Limit state of Collapse and Serviceability.

CO2: Analysis and Design of reinforcement for a section subjected to torsion, Side face reinforcement. Design and Detailing of a lintel beam & lintel with sunshade. Analysis & Design of Flanged Beams

CO3: Analysis of slabs spanning in one direction and spanning in two directions. Design & Detailing of a one-way slab, Design & Detailing of a cantilever chajja. Design & detailing of a two-way slab.

CO4: Detailing for special structures such as deep beams, corbels, walls, shear walls, underground and overhead water tanks, chimneys, bunkers and silos, piles, and pile caps

Textbooks:

1. B.C. Punmia, "Reinforced Concrete Structures", Vol.1&2, Laxmi Publications, Delhi, 2004.
2. IS 456, "Indian Standard, Plain and Reinforced Concrete", Code of Practice, Bureau of Indian Standards, 2000.
3. SP-16, Design Aids for Reinforced Concrete to IS 456 NBC of India, 1983
4. IS 1905, Code of Practice for Structural Safety of Buildings, 1987.

References:

1. Dass, M. M. *Structural Analysis*. New Delhi: PHI Learning.
2. Jindal, R. L. *Elementary Theory of Structures*.
2. Junnarkar, S. B. (1997). *Mechanics of Structures*. Vol. II. 22nd Ed. Charotar Publishers.
3. Punmia, B. C., Jain, A. K. and Jain, A. K. (1992). *Theory of Structures*. 9th Ed. New Delhi.

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23AR3117: Building Bye Laws and Office Management

L-T-P-S: 2-0-0-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/ PSO	BTL
CO1	To understand the importance of Building codes in different zones and learning about the terminologies	PO1	2
CO2	To learn the different norms from National Building Code of India	PO1	2
CO3	To learn the basic need of building bye laws of local region and to learn the terminology. To be introduced to Energy Conservation Building Code.	PO1	2
CO4	To learn basis office procedure and management techniques in architecture	PO8	2

CO1:

Introduction to building codes and norms: Introduction to Building codes, bye laws and regulations, their need and relevance. Overview of basic terminologies, nature of building codes in special regions like heritage zones, air funnels, environmentally sensitive zones, disaster prone regions, coastal zones, hilly areas, etc.

CO2:

Study of building regulations: Study of structure of Building bye laws, National Building Code etc. General building requirements, building classifications and permissible uses. Norms for exterior and interior open spaces, setbacks and margins, norms for building projections in open spaces, considerations in FAR, guidelines for open green areas. Plinth, habitable rooms, kitchen, wet areas, mezzanine, storerooms, elevated parts like chimneys, parapets etc. Means of access, norms for access widths for various types of buildings, requirements of parking spaces, Equivalent Car Space (ECS), standards for turning radius, access to service areas.

CO3:

Study the Role and functions of the administrative and Development authorities- Vijayawada Municipal Corporation, CRDA (Capital Region Development Authority) etc and the local regulations for building permissions, architectural control and provision of building services, regulations for super structures, building height regulations, regulations for multi storied buildings etc. Introduction of Energy Conservation Building Code (ECBC): Eco Niwas Samhita 2018, Part I and Eco Niwas Samhita 2021 (code compliance)

CO4:

Office management: Architectural office, architect, contractor, client relationships Office correspondence, filing and record keeping Human resource management. Scale of charges

Textbooks:

1. Handbook of Professional Documents 2020, by Council of Architecture, India
2. Model Building ByeLaws 2016, Municipal Administration and Urban Development Department
3. Architect's Pocket Book (2017), 5th Edition by Jonathan Hetreed, Ann Ross, Charlotte Baden-Powell, Routledge

Ar. A. Priya

Head of the Department

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23AR3120B: Sustainable Architecture

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/ PSO	BTL
CO1	To understand the fundamental and basic concepts of sustainable architecture	PO2, PO7	2
CO2	To understand the sustainable site planning and sustainable and socially responsible urbanism	PO2, PO7	2
CO3	To understand about the energy conservation, renewable and non-renewable energy	PO2, PO7	3
CO4	To learn about the sustainable building materials, conservation of water and waste management	PO2, PO7	3

Syllabus:

CO1:

Fundamentals of Sustainable Architecture : Characteristics of sustainable architecture, fundamentals of passive designing and climatology, thermal comfort, visual comfort, acoustic comfort, Climate Consultant Concepts and Terminology of Sustainable Architecture - Sustainable buildings, parameters of sustainable buildings, Green buildings definitions and categories, indicators of green buildings rating systems, Terminologies related to sustainable buildings- carbon footprint, life cycle analysis,, Urban Heat island, Development Footprint.

CO2:

Sustainable site planning : Site assessment and selection: topography, vegetation, built form, water, access to natural light, local wind patterns and micro climate; Site planning: layout, shape, spacing, orientation, mutual relationship, solar studies, pollution prevention and ecology, heat island effect Design for environment: Greenfield development, smart growth, brownfield redevelopment strategies and infill development, sustainable urbanism Socially responsible design: user-centered design, design education/ethics and sustainability.

CO3:

Energy: Forms of energy, energy sources: renewable and non-renewable, energy conversion: cogeneration and fuel cells Solar Energy: low temperature thermal systems (active & passive systems, solar air conditioning, solar water heating), high temperature thermal systems (solar thermal electricity system), photovoltaic systems, BPVs Wind Energy: traditional wind mills, wind turbines – HAWT and VAWT (SWOC analysis), Other renewable energy: methane gas (waste), energy crops (biomass conversion), sea and earth (geo-thermal) Energy Storage: reversible chemical reactions, phase change materials.

CO4:

Materials, water, and wastes: Building Materials: embodied energy of materials, renewable

Ar. A. Priya

Head of the Department

K.L - School of Architecture

Ar. A. Priya
Head of the Department
K.L - School of Architecture



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materials, reuse of materials Water efficiency: water use/ demand, quality of water, water conservation, ground water recharge Waste management: gaseous wastes, liquid wastes, solid wastes, recycling systems Contemporary exemplars of sustainable architecture. Energy efficient Building, Energy Modeling, and energy audit.

Textbooks:

1. Thomas, Randall & Fordham Max Sustainable urban design: an environmental approach" 2003.
2. Edwards, Brian and Hyett, Paul Rough guide to sustainability 2001.
3. Langston, Craig A. and Ding, Grace Sustainable practices in the built environment 2001.
4. Giovanni Baruch, "Passive and Low Energy Cooling of Buildings", VNR, New York, 1994.
5. Mackenzie Dorothy, "Green design: design for the Environment", Laurence King, London, 1997.

Reference book:

1. Farmer John & Richardson Kenneth, "Green Shift: Changing attitudes in architecture to the Natural World", Architectural Press, Boston, 1999.
2. The European Commission, "A Green Vitruvius: Principles and Practices of Sustainable Architectural Design", James & James, London, 1999
3. Gray, O., Robinette, "Landscape Planning for Energy Conservation", Van Nostrand Reinhold, New York, 1984.

23AR4131: Research Methodology

L-T-P-S: 2-0-0-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/ PSO	BTL
CO1	To learn the fundamentals of research methodology	PO1	2
CO2	To learn the fundamental of quantitative research techniques	PO4	2
CO3	To learn the fundamental of qualitative research techniques	PO4	2
CO4	Ability to written and verbal presentation	PO4	2

Syllabus:

CO1: Fundamentals of Research Introduction to research, types of research, research methods: qualitative, quantitative, and mixed measures Elements of research, research methodology, characteristics of good research, selection of appropriate research design, planning the research: problem statement, literature review, critical thinking, types of hypotheses, types of samples, methods of data collection, data analysis, research proposal preparation



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CO2: Quantitative Research in Architectural Design Development Data collection, tools of data collection, Types of research survey, questionnaires Introduction to Statistical analysis of data and graphical representation. Statistical theories: regression analysis, factor analysis and multivariate analysis

CO3: Qualitative Research in Architectural Design Development Interviews in research, observation, physical traces, archival research Case studies in architectural research Applied research in architectural design

CO4: Report Writing and Presentation Introduction to report and research paper writing- components of research paper and research report Introduction to different styles of referencing - Harvard and Chicago styles Presentation techniques: oral presentation, layout, printing process, internet, overhead, power point

Reference books:

1. Creswell, J. W. (2002) Research design: qualitative, quantitative, & mixed methods approach. Thousand Oaks, Sage.
2. Denscombe, M (2003) The good research guide: for small-scale research projects. Oxford University Press, London.
3. Dwivedi, R. S. (2001) Research Methods in behavioral science, McMillan, New Delhi.
4. Graziano, A. (1989) Research methods process of inquiry, Harper Collins Publishing New York.
5. Groat, L. and Wang, D. (2002) Architectural research methods, John Wiley publication, New York.
6. Harrigan, J. E. (1987) Human factors research methods, Elsevier, Amsterdam.
7. Kothari, C R (1990) Research Methodology: methods & techniques, 2nd edn, Wishwa Prakashan, New Delhi.

23AR4128A: Housing

L-T-P-S: 2-0-0-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Understand housing and Housing issues	PO1	2
CO2	Understand Housing, 5-year plans specific to housing and financial stakeholders.	PO3	2
CO3	Understand the various schemes related to Rural & Urban India.	PO4	2
CO4	Understand Planning- Physical, Administration, Socio-Cultural, Sustainable, Financial, Future forecasts, and Trends.	PO4	2

Syllabus:

CO-1:

Concept of shelter, timeline, Dynamics of housing (users, need, demand & supply, terminologies), Migration, urbanization, scale, scope, types of housings, and ownership. Housing issues – Census

Ar. A. Priya

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data statistics on current, future housing demand challenges.

CO-2:

Five-year plans specific to housing. National & State policies; Sources of Finance – Banks, Finance agencies; Development control regulations; Government & Private agencies Participation in Housing developments, Schemes related to Public Private Partnership, Redevelopment etc.

CO-3:

Classification of users on base of income; Rural Housing Schemes in India like PMAY, etc; Urban Housing Schemes like VAMBAY, TIDCO, etc; Low-cost housing, mass housing, Affordable Housing, Analysis of housing schemes for Rural & Urban India. Attempts to overcome housing shortfall in India. Identifying the potentials and alternative methodologies for housing (research Gaps).

CO-4:

Study of user profiles, Planning – Physical, Administration, Socio-Cultural, Sustainable, Financial, Future forecasts, and Trends. Contemporary solutions for housing like Bunker houses, Prefab 3D printing, Tube houses, Container housing. Latest, futuristic technologies and research-based trends on basis of all sectors in the world. Writing a research paper in consideration of housing.

Textbooks:

1. Babur Mumtaz and Patweikly, *Urban Housing Strategies*, Pitman Publishing, London, 1976.
2. GeoffreyK.Payne, *Low Income Housing in the Development World*, John Wiley and Sons,Chichester,1984.
3. John F.C.Turner, *Housing by people*, Marison Boyars, London, 1976.
4. Babur Mumtaz and Patweikly, *Urban Housing Strategies*, Pitman Publishing, London, 1976.
5. GeoffreyK.Payne, *Low Income Housing in the Development World*, John Wiley and Sons,Chichester,1984.
6. John F.C.Turner, *Housing by people*, Marison Boyars, London, 1976.
7. Martin Evans, *Housing, Climate and Comfort*, Architectural Press, London, 1980.

Reference books:

1. Martin Evans, *Housing, Climate and Comfort*, Architectural Press, London, 1980.
2. Forbes Davidson and Geoff Payne, *Urban Projects Manual*, Liverpool University Press, Liverpool,1983.
3. Bridging the Urban housing shortage in India, NAREDCO
4. Report on trend and progress of Housing in India
5. Revisiting Low Income Housing, A review of Policies and perspectives by PritikaHingorani
6. Housing Finance: A Study of Experiences of Commercial Banks by Dr. N.K Thingalaya, IndianInstitute of Banking and Finance, Mumbai
7. Housing and housing finance – A review of the links to Economic Development and poverty reduction by John Doling, Paul Vandenberg and Jade Tolentino, Asian Development Bank.
8. Urban Housing and Slums by A.K.Jain

Ar. A. Priya

Head of the Department

K.L - School of Architecture

Ar. A. Priya
Head of the Department
K.L - School of Architecture



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23AR4233A: Urban Design

L-T-P-S: 2-0-0-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO1	To understand the theory of urban design and its relationship with architecture, urban planning, and the users.	PO2, PO4, PSO1	2
CO2	To understand Users and Activities in a city	PO2, PO4, PO9	2
CO3	To understand public spaces, streets & Transport	PO2, PO4, PO9	2
CO4	To understand Application of Urban Design	PO2, PO4, PO9	2

Syllabus:

CO-1:

Introduction to urban design; relationship between urban design, urban planning, architecture & their role; terminologies; urban design as a multi-disciplinary field; identifying & analyzing stakeholders' role in the process of urban design. Users and activities in a city and their analysis; user needs and behavioral studies; socio-cultural and socio-economic aspects of people; memory and mental mapping.

CO-2: Urban Design Theories – Scope, Scale, Strategies, levels & legislation; "FIVE ELEMENTS" in a city; People- Centric Design and Public Participation. Urban morphology & Urban Character; Elements and aspects of Urban Design; Built & unbuilt spaces; Buildings; Public spaces, streets & Transport; Pedestrianization & streetscape; Movement pattern; Services; Defensible Spaces; Environment and Urban Design. Livable cities, Jane Jacobs studies; Analysis of Garden collen; Place making; Urban Conservation.

CO-3: Survey techniques- Evolution Analysis; Townscape analysis; Perpetual structure; Skyline; Watch tower concept; User group identification (mental, size & categories); Sense of belonging; Urban Street skeleton, Building densities; Universal Design aspects (phy. & Age); Permeability study (Privacy & Accessibility) & Visual Analysis; Constraints and possibilities; designing in a context and site planning; articulation of spaces; Flexibility, adaptability; Formulation of issues for intervention. Mapping of Urban areas – Building footprint, building heights, Scale & Proportion, Dead & Active spaces, Safety & Security, User mapping & movement study, User interaction with surroundings; Ecology of urban spaces; Nightlife.

CO-4: Application of Urban Design, Examples of Good Urban Design; New Urbanism, case studies and contemporary urban interventions; Urban designs at corridors like Water bodies, Major roads, Railroads, Metro lines, etc.; Research studies on Urban Fabric, Environmental psychology; Safeguarding Urban design environment; Overcoming urban blights, poorly functioning Urban

Ar. A. Priya
 Head of the Department
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areas. Encouraging studies towards writing Research papers related to Urban Design.

Textbooks:

1. Forbes Davidson and Geoff Payne, Urban Projects Manual, Liverpool University Press, Liverpool, 1983.

Reference books:

1. The Death and Life of Great American Cities, Jane Jacobs.
2. Image of the city, Kevin Lynch.
3. By the City/For the City by ANNE GUINEY & BRENDAN CRAIN.
4. A New Theory of Urban Design, by CHRISTOPHER ALEXANDER, HAJO NEIS, ARTEMIS NNINOU & INGRID KING.
5. Urban Acupuncture by JAIME LERNER.
6. *Urban Design Since 1945: A Global Perspective*, DAVID GRAHAME SHANE.
7. *Happy City: Transforming Our Lives through Urban Design – Charles Montgomery*
8. Design with Nature – Ian McHarg

23AR3223: Human Settlement and Planning

L-T-P-S: 2-0-0-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Familiarize the various elements of Human Settlements, the classification and Evolution and sustainment of Human settlements.	PO1, PO5	1
CO2	Understand familiarize the students with Planning concepts and process in Urban and Regional Planning.	PO1, PO7	2
CO3	Understand the changing dynamics of Urban Form and it's planning according to urban transformation & identifying the Research gaps in Settlement Planning.	PO3, PO9	2
CO4	Understand the development and role of planning body's role in India and encourage students to write Research papers with the knowledge acquired.	PO6, PO9	2

Syllabus:

CO 1:

Origin of Human Settlements: Theory of 'EKISTICS'. Elements of Human Settlements; Patrick Geddes "Valley of Civilization", River Valley Civilizations, Factors influencing the growth and decay of human settlements. Type and classification of settlements – Urban and Rural (International & National level). Before and after Industrial Revolution.

CO2:

Introductory study of the development of various settlement forms: Planning concepts and their

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Head of the Department
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relevance to Indian Planning practice – Ebenezer Howard (Garden City Concept), Patrick Geddes (Giddensian Triad), C.A Perry (Neighborhood Planning), Redburn Theory, Satellite Towns; Concept and Case studies. Town planning & Regional theories like Garden City, city beautiful movement, Linear city, Concentric circle theory, sectoral theory, Christaller weber central place theory, etc. City planning concepts envisioned by Architects like Le Corbusier, Frank Lloyd Wright, etc.,

CO3:

Urbanization: Fact, elementary theories and problems related to urbanization with social reference to India; Emergence of new forms of developments, Transportation, and communication – Potentials and limitations of roadways, Railways, Airways and Waterways in development of settlements; Problems and potentials. Sustainable usage of resources. Concepts of SMART cities, Utopian Cities, IOT facilities in Urban Planning, Modal Split, NMT, Pedestrianization of cities etc. ToD, Aeropolis, Linear cities, Livable Cities, etc.

CO4:

Brief Introduction to the town planning organization in India: Various levels of planning, National, Regional, Urban, Rural, Local etc. 73rd & 74th Amendments, differences, and relationships between them; Ecological, Social and Economic aspects of town planning in India; Definitions and terms in Indian context – Zonal plan, Master Plan, Land Use Plan, Development regulations, regional plans, etc. URDPFI & RADPFI guidelines. Concepts and their applicability in India, RURBAN, SAGY.

Textbooks:

1. C.L.Doxiadis, Ekistics, "An Introduction to the Science of Human Settlements", Hutchinson, London, 1968.
2. Andrew D.Thomas, "Housing and Urban Renewal", George Allen and Unwin, Sydney, 1986.
3. "Ministry of Urban Affairs and Employment", Government of India, New Delhi, 1999
4. "Urban Development Plans: Formulation & Implementation", Guidelines, 1996.

Reference Books:

1. Government of India, "Report of the National Commission on Urbanization", 1988.
2. Hansen N., "Regional Policy and Regional Integration", Edward Elgar, UK, 1996.
3. Sandhu. R. S., "Sustainable Human Settlements", Asian Experience, Rawat publications, 2001.
4. Gastek.P., "Living Plans: New concepts for advanced housing", Brikhauser publications, 2005.
5. URDPFI Guidelines, MoUD, India.
6. RADPFI Guideline, MoPR, India.
7. The City of Tomorrow: Sensors, Networks, Hackers, and the Future of Urban Life – Carlo Ratti and Matthew Claudel.

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Head of the Department
K.L - School of Architecture

Ar. A. Priya

Head of the Department

School of Architecture



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23AR4234A: Behavioural Architecture

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcome	PO/PSO	BTL
CO1	Identify concepts and concerns of perception. Identify and develop the sensitivity to the needs of users and clients	PO1, PO4	2
CO2	Understanding the designing and planning for urban quality	PO6, PO10	2
CO3	Identify and apply the macro and micro built environment and behavioural aspects	PO3, PO9	3
CO4	Analyse the relationship between built - environment and perception	PO3, PO9	4

Syllabus:

CO1:

Concepts And Concerns of Perception: Definition - Visual perception - perceptual constancy, objective and spatial vision, attention and awareness, methods of vision perception and science.

Developing Sensitivity to The Needs of Users and Clients Architectural assumptions and Environmental Designs, Designs and social practices, involvement of clients and user in Designs and built environment, realities of clients and public their impact projects and designs

CO2:

DESIGNING AND PLANNING FOR URBAN QUALITY: Quality of urban environment and living - past, present, and future trends, role of urban design in urban environment, planning for quality living in urban areas

CO3:

Macro And Micro Built Environment and Behavioural aspects: Relationship of built environment to society, spatial relationship within built - environment, influence of physical environment on human behaviour, influences of built environment on human behaviour

CO4:

Built - Environment and Perception: Case studies of tall buildings, low raise neighbourhoods, interior and exterior elegance of built environment, local and regional level landscape.

Textbook:

1. Parfeet M and Power G, Planning for urban quality, Rent ledge, London 1977.
2. Johathan Batnett - Urban Design as public polody - Haxper and row Publications New York, 1983.

Reference Books:

1. Yantis. S (2001), Visual perception, Psychology Press, Philadelphia.
2. Nicol D and Pilling S (2000), changing Architectural education - Towards new
3. Frey H, (1999), Eand FN Spon, London.
4. Dovey K, (1999) Framing Places, mediating power in built form, Rent ledge, London.



Ar. A. Priya

Head of the Department

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22AR3116: Building Services- II

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO1	Study of electricity, installations, wiring and principles of distribution and safety	PO1,	2
CO2	Know the application artificial illumination, and lighting design for various spaces	PO3,	2
CO3	Knowledge of ventilation principles	PO3, PO9	2
CO4	Understanding properties of sound and Architectural acoustics, and analyzing acoustic concepts and design, learning how to create acoustic and lighting designs to different building types – Studio work	PO3, PO9	2

Syllabus:

CO1:

Electrical Services: Electrical systems – Basic of electricity– single/Three phase supply – protective devices in electrical installation – Earthing for safety – Types of earthing – ISI Specifications. Electrical installations in buildings – Types of wires, wiring systems and their choice – planning electrical wiring for building – Main and distribution boards –Principles of illumination.

CO2:

Illumination and Lighting Design: Visual tasks – Factors affecting visual tasks – Modern theory of light and colour – synthesis of light – Additive and subtractive synthesis of colour – Luminous flux – Candle – solid angle illumination – utilization factor – Depreciation factor –MSCP – MHCP –Laws of illumination. Classification of lighting –Artificial light sources – Spectral energy distribution – Luminous efficiency – Colour temperature – Colour rendering. Design of modern lighting – Lighting for stores, offices, schools, hospitals, and house lighting. Elementary idea of special features required, and minimum level of illumination required for physically handicapped and elderly in building types. **Electrical Layout of Simple Buildings:** Electrical layout of a simple residential, school, and commercial building.

CO3:

Ventilation: The wind, The effects of topography on wind patterns, Air currents around the building, Air movement through the buildings, air changes, quality of air, use of fans, thermally induced air currents, pressure losses: Buoyancy-driven (Stack effect, Venturi effect) – Use of courtyard. Lab: Types of anemometers and its use. Wind tunnel experiment for wind movement around the buildings, Simple experiments to measure outdoor and indoor wind velocity.

CO4: Fundamentals of architectural acoustics Fundamentals: Sound waves, frequency, amplitude, decibels, logarithms, measurement versus perception, addition, and subtraction of decibels. NC curves. Material property: Absorption, reflection, scattering, diffusion, transmission, absorption coefficient, NRC, sound transmission class (STC), impact insulation class (IIC). **Acoustics of Architectural Spaces:** Reverberation time, sound in enclosed space, basic room acoustics concepts

Ar. A. Priya


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and design, design of auditorium, conference hall, recording studio and classrooms. Environmental noise and its control.

Textbooks:

1. Barron, M. (2009). Auditorium acoustics and architectural design. 2nd Ed. Taylor & Francis.
2. Concept nine, R. (2008). The Architecture of Light: Architectural Lighting Design Concepts and Techniques. Sage Publications.
3. Cox, T. J. and D'Antonio, P. (2009). Acoustic Absorbers and Diffusers. 2nd Ed. Taylor & Francis
4. Cuttle, C. Lighting by Design. 2nd Ed. Architectural Press.
5. Eagan, D. M. (2002). Architectural Lighting, 2nd Ed. McGraw-Hill.
6. Eagan, D. M. (2002). Concepts in Architectural Acoustics.
7. Guzowski, M. (1999). Day lighting for Sustainable Design. McGraw Hill.
8. Harold, B. M. and Good friend, L. Acoustics for Architects. Reinhold.

References:

1. Heschong, L. (1976). Thermal Delight in Architecture. Cambridge: MIT Press.
2. Hopkins. C. (2008). Sound Insulation: Theory into Practice. 1st Ed. Butterworth Heinemann.
3. Randall, W. (2008). Residential Lighting: A Practical Guide to Beautiful and Sustainable Design. 2nd Ed. Wiley.
4. Rea, M. (2000). The Lighting Handbook. 9th Ed. Illuminating Engineering Society of North America.
5. Reinhart, C. (2014). Day lighting Handbook.
6. Smith, B. J., Peters, R. J. and Owen, S. (1982). Acoustics and Noise Control. New York: Longman.
7. Steffy, G. (2000). Time-Saver Standards for Architectural Lighting. McGraw-Hill.
8. Szokolay, S. V. (2008). Introduction to architectural science. Taylor & Francis.
9. Vigran, T. E. (2008). Building Acoustics. 1st Ed. Taylor & Francis.

23AR3221: Building Services – III

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO 1	An understanding of Thermal Properties of the building material and components and mechanical ventilation	PO1,	2
CO 2	To understand the principles, systems, and design criteria of HVAC	PO1,	2
CO 3	To gain knowledge about fire safety norms in the buildings	PO1,	2
CO 4	To understand the mechanical transportation systems in buildings	PO3,	3

Syllabus:

CO1:

Thermal Properties of the building material and components and mechanical ventilation:
 Behaviour of heat propagation, thermal insulating materials and their co-efficient of thermal conductivity. General methods of thermal insulation: Thermal insulation of roofs, exposed walls.



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Ventilation: Definition and necessity, system of ventilation. Principles of air conditioning Air cooling, Different systems of ducting and distribution, Essentials of air-conditioning system.

CO2:
HVAC: Principles, Systems and Design Criteria: Thermodynamics. Transfer of heat. Refrigeration cycle components. Vapor compression cycle. Refrigerant, Compressor, condenser, evaporator, refrigerant control devices, electric motors, air handling units, cooling towers. Air conditioning systems for buildings of different scales and their requirements- window type, split system, package unit, direct expansion system, chilled water system, fan coil unit, district cooling systems. Energy efficient systems, environmental aspects, and latest innovations. Design criteria for selection of air conditioning. Configuring/ sizing of mechanical equipment, equipment, and spaces for them. Horizontal and vertical distribution of services for large buildings. Exercise on the above through choice, calculations, layout, drawings.

CO3

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

CO4:

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

Textbooks:

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

Reference Books:

1. A.F.C. Sherratt, 'Air Conditioning and Energy Conservation', the Architectural Press, London, 1980.
2. Andrew H Buchanan; 'Structural Design for Fire Safety', Wiley, 2001.
3. Swenson S. Don, 'Heating, Ventilating and Air Conditioning', American Technical Publishers, 1995.
4. ASHRAE, 'All about AHUs- Air Handling Units'.
5. CIBSE Guide D, 'Transportation Systems in Buildings', 2010.

Ar. A. Priya

Head of the Department

K.L - School of Architecture

Ar. A. Priya

Head of the Department

K.L - School of Architecture



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6. A. K. Mittal, 'Electrical and Mechanical Services in High Rise Building: Design and Estimation Manual', CBS, 2009.

23AR4126: Building Services – IV

L-T-P-S: 3-0-0-0

Credits: 3

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO):

CO NO	Course Outcomes	PO/PSO	BTL
CO1	To understand the philosophy of building automation systems and subsystems	PO1,	2
CO2	To learn about the communication and security systems	PO1,	2
CO3	To learn about the integration of building services into architectural design	PO1,	2
CO4	To learn about the Interaction and integration between building structure, systems, services, management, control, and information technology.	PO3,	3

Syllabus:

CO1:

Building Automation Systems & Controls: Philosophy. Introduction to System configuration, system modules, distributed systems, communication protocol and on-line measurements. Fire protection, security, and energy management. Control objectives. Sensors, controllers, and actuators. Understanding the concept of Microprocessor based controllers & digital controls. Examples of sub-systems such as - Digital Addressable Lighting Interface (DALI) and how it's useful to Architects.

CO2:

Communication and Security Systems: Voice communication systems, local area network, wireless LAN, Digital TV, CCTV, digital CCTV, teleconferencing, cellular phone system, and CABD. SMATV. Data networking. Short- and long-haul networks. Wideband network. Office automations. Public address/sound reinforcement systems. Digital public address system. Modern security systems.

CO3:

Integration of Services into Architectural Design: Introduction to Smart Building concept. Principles of grouping and integrating of horizontal and vertical distribution of all services in a multi- storeyed building/ large building. Services to include vertical transportation, electrical, communication, air conditioning and fire safety.

CO4:

Interaction and integration between building structure, systems, services, management, control, and information technology. Different Application & Design software available. Integrating service requirements into architectural design in an appropriate typology involving a simple scale project through sketches/ drawings.



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23AR2157: Computer Studio – I

L-T-P-S: 0-0-4-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To understand the basics of computer system and their supporting technologies like MS Office.	PO1, PO2	2
CO 2	To create documentation reports, analysis reports, and audio visual presentations.	PO1, PO2	2
CO 3	To reciprocate the tools of 2D visualization to create architectural drawings.	PO1, PO2	2
CO 4	To create layouts, plot/print to scale drawings, design and edit 2Dgraphic images.	PO1, PO2	2

Syllabus:

CO1:

Technology of small computer system, computer terminology operation principles of P.C, introduction to application software, and graphic system, and use of printers, scanner, plotter, File management, etc. Understanding Bitmap images and Vector Graphics, Image size and Resolution. Basic Tools for Editing and Creating Graphics.

CO2:

Introduction to various software for documentation, presentation & drawing purposes. Simple operations such as creating, editing, formatting, saving, and printing documents. Familiarizing the use of scanners, printers, plotters etc.

Introduction to Applications of MS Office in presentation: Microsoft Word, Microsoft Power Point, Microsoft Excel, Adobe Page Maker.

Use of spreadsheet and for various architectural calculations-estimation, area calculations, project reports. Preparations of templates for regular repetitive functions.

CO3:

Introduction to AutoCAD as 2D drafting tool Digital drawings tools, drawing lines and shapes, modifying lines and shapes, drawing with accuracy and speed. Organizing plans, sections, and elevations, drawing and printing to scale, text styles and sizes, hatches, and dashed lines. Stencils and blocks, advanced editing tools, and dimensioning drawings.

CO4:

3D modelling using AutoCAD Introduction to 3D-modelling technique using AutoCAD. 3D basics:

Ar. A. Priya

Head of the Department

K.L - School of Architecture

Ar. A. Priya

Head of the Department

K.L - School of Architecture



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Axes, Planes and Faces. 3D Object Modification: Rotate, Mirror, Array and Scale. 3D Boolean operations: Union, Subtract, Intersect. 3D primitive objects: Box, Wedge, Cone, Sphere, Cylinder, Torus and Pyramids. Solid modeling: Revolve, Shell, Taper, Loft, Path extrusion and sweep.

Reference books:

1. Ralph Grabowski, "The Illustrated AutoCAD 2002 Quick Reference", 1st edition, Cengage Learning, 2001.
2. Shamtikoo, "AutoCAD 2000: A Problem-Solving Approach", DelmarCengage, 1999.
3. Fiorello. J. A., "CAD for Interiors beyond the basics", Wiley publications, 2011.

23AR2262: COMPUTER STUDIO – II

L-T-P-S: 0-0-4-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To learn the use of image editing software	PO1, PO2	2
CO 2	To create images and animation using graphics and animation software	PO1, PO2	2
CO 3	To understand, visualize the space and apply the tools of sketch up or equivalent software	PO1, PO2	2
CO 4	To create a detailed 3D model by working in collaboration by application of advanced tools	PO1, PO2	2

Syllabus:

CO1: Introduction of various software available for Architectural presentation such as Photoshop & Coral.

CO2: Image doctoring and manipulation using computer software for graphics and animation (Photoshop and Flash).

CO3: Building Modelling and basic rendering techniques, using 3DSMax or Sketchup or equivalent.

CO4: Advanced Building Modelling and basic rendering techniques, using 3DSMax or Sketchup or equivalent.

Textbooks:

1. Deke McClelland, "Photoshop 7 Bible Professional Edition", Wiley John & Son INC, New York, 2000.
2. Aouad, "Computer Aided Design guide for Architecture, Engineering and construction", Spon process, 2012.
3. Adobe Creative Team – Adobe Photoshop CS (Class Workbook).



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22AR3165: COMPUTER STUDIO – III

L-T-P-S: 0-0-4-0

Credits: 2

Prerequisite: Nil

Mapping of Course outcomes (CO) with program outcomes (PO)

CO NO	Course Outcome	PO/PSO	BTL
CO 1	To understand interface, workspace, and utilization of tools of 3D modeling software applies the required tools and components in building a 3D model.	PO1, PO2	2
CO 2	To create documentation reports, analysis reports, and audio visual presentations.	PO1, PO2	2
CO 3	To understand, visualize the space and apply the tools of BIM software, identify the need of tools of BIM software.	PO1, PO2	2
CO 4	To create a detailed 3D model by working in collaboration by application of advanced tools	PO1, PO2	2

Syllabus:

CO1: Explain the uses of BIM (building information Modeling), touching upon the Concepts used in 2D Drawing and extending to 3D Modeling, Basic awareness on Interface, Setting up workspace. 3D modeling using Walls – Windows – Doors – floors – Slabs – Staircase – Railing – Furniture.

CO2: Basic editing of components. Using Cross Sections Tool. Exporting 3D Model to Architectural 2D- Drawings (Plans – Elevations – Sections – Details.).

CO3: Introduction – Applying materials – Creating and Editing materials – Setting up Camera – Rendering settings – Enhancing final output using Image editing software. Curtain Walls – Columns – beams – Massing – working in collaboration. Adding Architectural Elements – Creating components – Rendering in Cloud.

CO4: Integration of all services and structural components using Building information modelling.

Textbooks:

1. Ryan Duell, Tobias Hathorn, Tessa ReistHathorn, "Autodesk Revit Architecture 2016 Essentials: Autodesk Official Press", Sybex, First Edition, 2016.
2. Eric Wing, "Autodesk Revit 2017 for Architecture No Experience Required", Sybex, First Edition, 2016.
3. Eric Wing, "Autodesk Revit 2017 for Architecture No Experience Required", Sybex, First Edition, 2016

Reference books:

1. Marcus Kim, Lance Kirby, Eddy Krygiel, "Mastering Autodesk Revit 2017 for Architecture", Wiley India, 2016.
2. Prof Sham Tickoo Purdue Univ, "Exploring Autodesk Revit 2017 for Architecture", CAD/CIM, Technologies, 13th Edition, 2016.

Ar. A. Priya

Head of the Department

K.L - School of Architecture

At. A. P. 1915
Head of the Department
K. I. School of Agriculture