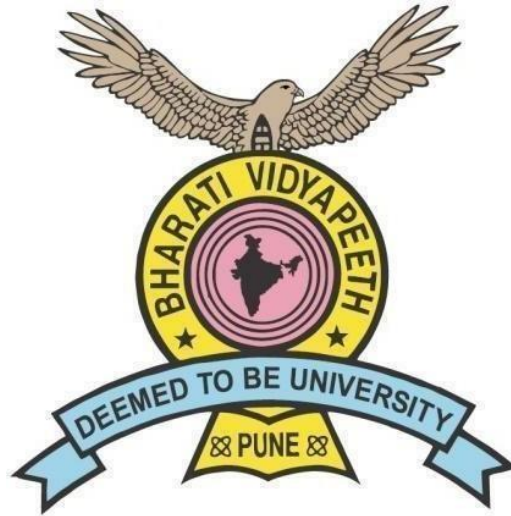




**BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE**

**Faculty of Engineering and Technology
B. Arch (Bachelor of Architecture)
New Syllabus**



**Structure & Rules of Examination
For
Bachelor of Architecture (B. Arch) Programme (CBCS 2020)**

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune



Prof. Dr. Shivajirao Kadam
M.Sc., Ph.D.
Chancellor

Prof. Dr. M. M. Salunkha
M.Sc., Ph.D., Ph.D.
Vice-Chancellor

Bharati Vidyapeeth (Deemed to be University)

Pune, India,

Founder Chancellor: Dr. Patangrao Kadam

★ Accredited with 'A+' Grade (2017) by NAAC ★
★ Category I University Status by UGC ★
★ NIRF Ranking 66 ★

"Social Transformation Through Dynamic Education"

and Beyond

Dr. Vishwajeet Kadam
B.Tech., M.B.A., Ph.D.
Pro Vice-Chancellor

G. Jayakumar
M.Com., Ph.D.
Registrar

NOTIFICATION NO. 1055

It is hereby notified for the information of all concerned that the proposal to revise the course structure, syllabus and rules of examinations of B.Arch. programme proposed by the concerned Board of Studies and recommended by the Faculty of Engineering and Technology is considered by the authorities of the University.

The authorities of the University have approved the course structure, rules of examinations and 1st year syllabus of B.Arch. programme offered under the Faculty of Engineering and Technology to be implemented from the academic year 2020-21 :

Ref. No. BVDU/ 2020-21/1786
Date : November 5, 2020

G. Jayakumar
Registrar

1. The Principal, College of Architecture, Pune 43
2. The Dean, Faculty of Engineering and Technology, Pune 43
3. The Controller of Examinations, BVDU
4. The IT Cell for uploading in the Website.

Adm/Syllabus/Examiner/COA H.E.

Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune-43.	
Inward No.:	121
Date:	01/11/2020
Sign:	

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VISION OF BV (DU) UNIVERSITY

“To be a world class University for Social Transformation through Dynamic Education”

MISSION OF BV (DU) UNIVERSITY

- To provide quality technical education with advanced equipment, qualified faculty members, and infrastructure to meet the needs of the profession and society.
- To provide an environment conducive to innovation, research and entrepreneurial leadership.
- To practice and promote professional ethics, transparency, and accountability for social community, economic and environmental conditions.

VISION OF BV (DU) COLLEGE OF ARCHITECTURE PUNE

“Inculcate Sensitivity towards Sustainable Built Environment through Architectural Education”

MISSION OF BV (DU) COLLEGE OF ARCHITECTURE PUNE

The institution shall strive

- To inculcate knowledge, skills, values and ethics to create ‘**socially responsible**’, ‘**environmentally sensitive**’, ‘**economically conscious**’, architectural professionals.
- To promote innovations and research for a sustainable built environment.

PROGRAMME: BACHELOR OF ARCHITECTURE (B.ARCH)

Programme Objectives:

- To develop creative, capable, future ready architectural professionals.
- To create responsible and dedicated individuals who are intellectually mature, emotionally sensitive and self-motivated towards a sustainable built environment.
- To orient courses and course content in order to develop holistic learners, for taking up challenging responsibilities in the respective field.
- To offer courses which help the graduates to emerge as competent professionals fully aware of their commitment to the society and nation.

Programme Outcomes:

The graduates will be able to:

- Imbibe the fundamental knowledge of the built environment.
- Identify and analyse current architectural issues.
- Create and envision a built environment responding to physical, social, cultural, economical and environmental context.
- Communicate effectively in verbal, written and graphical form.
- Use modern architectural tools, technology and software for analysis, design and construction.
- Imbibe ethics and values as learners and professionals.
- Develop research ability and promote experiential learning.
- Function effectively as an individual; work cooperatively and responsibly as a team.
- Encourage interdisciplinary learning.
- Prepare for professional, societal and environmental challenges.
- Promote managerial, entrepreneur and leadership qualities in profession.

SALIENT FEATURES OF SYLLABUS

- Imparting '**Outcome Based Education**'.
- Included programme outcome, programme specific outcome, course outcome and intended learning outcome.
- Categorisation of courses focusing on development of 'Cognitive', 'Affective' and 'Psychomotor' domains of learning and learners.
- Offers a wide range of electives in every semester, which facilitates choice to learners in selecting courses of their own interests. Introduced open electives at First year B.Arch.
- Skill enhancement facilitated through professional skill courses as well as open electives.
- Practical training incorporated in VIII semester which helps students in achieving research ability by providing consecutive courses such as Research projects and Architectural design Project in IX and X semesters respectively.
- Social and environmental awareness through 'Audit Courses'.
- Vertical progression and horizontal integration of courses considering the stage of development of learning.

RULES FOR FIRST TO FIFTH YEAR B. ARCH

Rule No.1: Eligibility for Admission

Eligibility Criteria: Students seeking admission to First year of Bachelor's Degree Course in Architecture must fulfil the eligibility criteria laid down by Council of Architecture, New Delhi, India and the University as applicable from time to time.

Rule No.2: Duration of the course (as per Council of Architecture)

The Architecture course shall be of minimum duration of 5 academic years/ 10 semesters of approximately 15 to 18 working weeks (90 work days)each, inclusive of one semester of approximately 16 working weeks of Practical Training during Semester-VIII in a Professional's office.

Rule No.3: Scheme of Assessment

A candidate to be eligible for the degree of Bachelor of Architecture will be required to appear for and pass all examinations as under:

- Semester I Examination in Architecture (First Year Semester-I)
- Semester II Examination in Architecture (First Year Semester-II)
- Semester III Examination in Architecture (Second Year Semester-III)
- Semester IV Examination in Architecture (Second Year Semester-IV)
- Semester V Examination in Architecture (Third Year Semester-V)
- Semester VI Examination in Architecture (Third Year Semester-VI)
- Semester VII Examination in Architecture (Fourth Year Semester-VII)
- Semester VIII Examination in Architecture (Fourth Year Semester-VIII)
- Semester IX Examination in Architecture (Final Year Semester-IX)
- Semester X Examination in Architecture (Final Year Semester-X)

Rule No. 4: Granting of Academic Term

Each semester shall comprise of Eighteen weeks (Minimum 90 working days).

The candidate will be permitted to appear for semester examination only if he/she has,

- **75 % attendance in each course that constitutes a head of passing as prescribed by the university.**
- **Satisfactory completion of the sessional work as prescribed in the syllabus.**
- **Good conduct:** The Principal/ Director of the institution shall have the right to withhold the student from appearing for examination of a specific course if the above requirements are not fulfilled.

Rule No. 5: Progression Requisite

As a general rule, a student shall be allowed to keep the next year of study of the course, if he/she has a backlog of not more than “**Six heads of passing**” in the preceding year.

Furthermore,

- A student shall be allowed to get admitted to Second Year B. Arch. course, if he/she has a backlog of not more than “**Six heads of passing**” at First year B. Arch (semester I and II considered together).
- A student shall be allowed to get admitted to Third Year B. Arch course, if he/she has cleared all the heads of passing at First year B.Arch and if he/she has a backlog of not more than “**Six heads of passing**” at Second Year B.Arch (semester III and IV considered together).
- A student shall be allowed to get admitted to Fourth Year B.Arch course, if he/she has cleared all the heads of passing at Second Year B.Arch (Semester III and IV considered together) and if he/she has a backlog of not more than “**Six heads of passing**” at Third Year B.Arch (semester V and VI considered together).
- A student shall be allowed to get admitted to Final Year B.Arch course, if he/she has cleared all the heads of passing at Third Year B. Arch (Semester V and VI considered together), and if he/she has a backlog of not more than “**Six heads of passing**” at fourth Year B.Arch (semester VII and VIII considered together).

Rule No 6: Examinations

6.1. Conduct of Examinations

The university examinations for all the 10 semesters shall be conducted at the end of each semester by the University.

6.2. Pattern of Examination: The evaluation scheme for B.Arch comprises of --

University Examination (UE) -60 marks (for courses having IA and UE both)

Internal Assessment (IA)- 40 marks (for courses having IA and UE both)

Internal Assessment (IA) - 100 marks (for courses having only IA)

UE and IA will constitute two separate heads of passing.

6.2.1 University Examination (UE)

- UE will be conducted by the University and will be based on the entire syllabus.
- UE shall be assessed jointly by the internal and external examiners from amongst the panel approved by the University in equal weight-age. An examiner for any of the courses of examinations shall have a minimum of 5 years teaching or 5 years of professional experience in his/her field of study. However, an external examiner for Semester-X Architectural Design Project shall have a minimum of 10 years teaching/ professional experience after Council of Architecture registration.
- The nature of assessment will vary depending upon the course and its delivery and whether it is studio-based or theory based. **Refer to detailed syllabus for individual courses.**
- Work done by the student which is assessed for UE i.e Sessional (SS) or Sessional + Oral (SO) will be based on entire syllabus.
- Number of assignments for UE will be minimum **three** and a maximum **five**.
- UE may be undertaken through following suggestive form of assignments (but not restricted to):
 1. Portfolio
 2. Models
 3. Reports

University Examination (UE) head will constitute ANY ONE of the following:

a. Sessional(SS) : Assessment by internal & external examiner in equal weight-age of the session , that is ,work done by the student during the semester and certified by the course teacher.

b. Sessional + Oral(SO): Assessment by internal & external examiner in equal weight-age of the sessional ,that is, work done by the student during the semester and certified by the course teacher along with oral of the student is to be conducted (i.e. provided that the student appears for UE).

c. Terminal paper (TP): Assessment by internal & external examiner in equal weight-age of total maximum marks. (Duration of paper: 2-1/2 hrs. for theory paper & 3 hrs. for drawing paper.)

6.2.2: Internal Assessment (IA)

IA will be conducted by the Institution imparting B.Arch. course. IA will be done by the teacher teaching the course through a continuous assessment system that is spread through the duration of course and weight-age will be for the session, that is, work done by the student during the semester & assessed by the course teacher covering the entire syllabus. The marks assigned for attendance in IA weight-age will be 5(five) only. Number of assignments for IA will be minimum **three** and a maximum **five**.

There will be 15(fifteen) teaching and 3(three) assessment weeks in a semester.

Individual faculty members shall have the flexibility to design the continuous assessment assignments in a manner so as to evaluate student's capabilities across knowledge, skills and attitudes. IA may be undertaken through any or combination of the methods stated below:

The following components can be used-

- Seminar presentation
- Written Test /Open Book
- Reviews
- Essays
- Short answer questions
- Study of best practices /precedent study/field study
- Multiple choice questions/Quiz
- Projects/group projects/Dissertation
- Reflective Practical assignments
- Drawing Portfolios
- Report writings
- Learning logs/diaries
- Hands on workshops and participation

For IA, in case of courses having Terminal paper (TP), it is mandatory to conduct minimum one class- test as a form of assignment.

The faculty shall announce in advance the units based on which continuous assessment shall be conducted. Detailed records of continuous assessment shall be maintained by the teaching faculty and these will be submitted to the institute at the end of the semester.

Rule No. 7: Credits

The total credits for the B.Arch. degree programme are 296 credits.

Semester-wise distribution of credits is as follows:

Semester	I	II	III	IV	V	VI	VII	VIII	IX	X
Credits	30	30	30	30	30	30	30	30	28	28

7.1. Evaluation criteria for additional credits:

Credit may also be given for participation in extra-curricular/co-curricular activities. There will be a maximum of **10 credits at UG level. 25-30 hours** of extra-curricular/ co-curricular work may be considered as one credit.

Participation in these activities at national/ international/state level can be claimed to earn a maximum of 10 extra credits which are over and above the minimum number of credits the student has to complete for award of the degree. These credits would be awarded for the type of activity undertaken from the joining of course till the end of course. Students have to submit the necessary documents at the end of Semester-X.

7.2. Award of extra credits per participation

Sr.No	Type of Activity	Credits Awarded
1	Publication in International/ National Journal(for 1st or 2nd author only)	01
	Publication in Scopus/ Referred Journal	02
2	Participation with presentation in seminar, workshop, conference, etc. (national/ international/state/ local))	01
3	Participation in seminar, workshop, conference, etc. (national/ international /state/ local)	0.5
4	Sending entry to design competition held at state / national / international level	01
5	Winning award at the contest mentioned above	02
6	Publication of Final year Architectural Design Project in International/ National Journal under guidance & co-authorship of guide.	1
7	MOOC Courses with certificate:	
	1) 4 hr. /week course	1
	2) 12 hr. /week course	3
	3) 4 hr./week course	1
	4) 12 hr./week course	3

The student has to accumulate and submit the respective documents to the principal, to become eligible for getting the credits as mentioned above.

7.3. Non-credit courses -Audit Courses:

Audit Courses will be conducted in Semester-IV and Semester-VI as per the syllabus. Universities will conduct examinations and it is mandatory for students to pass in these courses. Passing in these courses is by clearance. **Audit courses are Non-credit courses**

7.4. Credit Transfer:

Credit transfer option may be made available to students on exchange with other universities under MoUs if any after verifying the equivalency for particular courses on a case to case basis.

Rule No.8: Criteria for Passing

To pass in every semester examination and earn a minimum grade point, a candidate must obtain minimum 50% marks in each head of passing and 50% marks in aggregate.

8.1. For all courses, both UE and IA constitute separate heads of passing.

- In order to pass in such courses and earn minimum grade point.
- The student must obtain minimum grade point of 6.0(50% marks) at UE and also minimum grade point of 6.0 (50%) marks at IA.
- A student who fails at UE in a course has to reappear only at UE as a backlog candidate and clear the head of passing. Similarly, a student who fails in a course at IA has to reappear only at IA as a backlog candidate and clear the head of passing.

8.2. Students with a backlog in IA will have to present themselves and their work for continuous assessment throughout the semester for which they intend to appear.

8.3. In case of backlog courses, a student can work on the same topic of assignment for two more chances. Even after two chances in case he/she fails, the course teacher may change or modify the topic of assignment.

Rule No.9: Grading system

The grading system will be a 10-point absolute grading system.

9.1 Award of Grades (Ten point Grading systems):

The assignment of score obtained by the candidate (out of maximum 100) to a grade may be done as follows:

Range of Marks (Out of 100)	Grade	Grade Point
$80 \leq \text{Marks} \leq 100$	O	10
$70 \leq \text{Marks} < 80$	A+	9
$60 \leq \text{Marks} < 70$	A	8
$55 \leq \text{Marks} < 60$	B+	7
$50 \leq \text{Marks} < 55$	B	6
Marks < 50	D	0

9.2 Performance

The performance of a student will be evaluated in terms of two indices, viz

- a) Semester Grade Point average (SGPA) is calculated separately after every end-semester examination.
- b) Cumulative Grade point average (CGPA) is calculated across all the semesters at the end of the programme.

9.3 Semester Grade point average (SGPA)

SGPA measures the cumulative performance of a learner in all courses in a particular semester. SGPA is calculated by the formula

Where the credit-value is assigned to a course and is a GPA obtained by the learner in the course.

The SGPA shall be calculated up to two decimal places accuracy.

9.4 Cumulative Grade point average (CGPA)

CGPA measures the cumulative performance of a learner in all courses since his/her enrolment. CGPA is calculated by the formula

Where the credit-value is assigned to a course and is a GPA obtained by the learner in the course.

The CGPA shall be calculated up to two decimal places accuracy.

Rule No.10: Award of Degree (B.Arch.)

A student who has completed the minimum grade point specified for the programme and obtains required CGPA as prescribed (in the table below) shall be declared to have passed in the programme. The final result will be in terms of letter grade only and is based on the CGPA of all courses studied and passed within the time permissible by the University & as per COA Rules prescribed.

The criteria for the award of **Degree (B.Arch.)** are as given in table below:

Range of CGPA	Final Grade	Letter Grade
9.50 CGPA 10.00	O	Outstanding
9.00 CGPA 9.49	A+	Excellent
8.00 CGPA 8.99	A	Very Good
7.00 CGPA 7.99	B+	Good
6.00 CGPA 6.99	B	Satisfactory
CGPA Below 6.00	F	Fail

Degree Requirements:

A candidate who has successfully completed all the Core and Elective courses and obtains required CGPA as prescribed (in the table above), shall be eligible to receive the Degree.

Registration (as an Architect) will only be given by the Council of Architecture, New Delhi, India as per the prevailing rules.

University & Council of Architecture, New Delhi may frame additional rules and regulations or modify these rules if needed and once approved they would be binding on the students.

Rule No.11: Introduction of this Curriculum

The new curriculum for the degree course in architecture B.Arch will be introduced from Academic Session 2020 -2021

- First year B.Arch. Course from June 2020
- Second year B.Arch. Course from June 2021
- Third year B.Arch. Course from June 2022
- Fourth year B.Arch. Course from June 2023
- Final year B.Arch. Course from June 2024

Rule No.12: Course Code

Code used for serial numbers of the courses in the structure for B.Arch. course shall be as follows:

12.1. First Character: will be Faculty and for Engineering Faculty BVDU has assigned K character.

12.2. Second Character: will be for BoS to which that course belongs (H for Architecture)

12.3. Third character: relates to Department for which course is to be conducted (M for Architecture)

12.4. Fourth character: will be for UG or PG course (U for UG in Architecture)

12.5. Fifth Character: will stand for Semester No.

Semester Code:

1. First Semester
2. Second Semester
3. Third Semester
4. Fourth Semester
5. Fifth Semester
6. Sixth Semester
7. Seventh Semester

8. Eighth Semester
9. Ninth Semester
10. Tenth semester

12.6. Sixth character: will be serial no. of course in that semester structure from 1 to 9.

Rule No.13: Maximum period for duration of course

Students have to qualify for a degree within the period prescribed by the University Grants Commission. If the student could not, he/she will be allowed two more years beyond the prescribed period. In exceptional cases, further extension of one more year, may be considered by the University. University & Council of Architecture, New Delhi may frame additional rules and regulations or modify these rules if needed and once approved they would be binding on the students.

In case a candidate is not able to complete the course in the prescribed duration, the university or institution may provide an exit option for the candidate if has completed and earned all credits for the first three years of study.

STRUCTURE OF B.ARCH DEGREE PROGRAMME

Structure of B.Arch. degree programme is proposed to be implemented from academic year 2020-21, to provide students centric educational philosophy.

A. Course Categories:

Under CBCS, the degree programme will consist of the following categories of courses, in the framework of council of Architecture:

1. Professional Core Courses (PC)
2. Building Science and Applied Engineering (BS& AE)
3. Enhancement Course
4. Skill Enhancement Courses (SEC)
5. Professional Ability Enhancement Courses (PAEC)
6. Elective Courses
 - a. Open Electives (OE)
 - b. Professional elective (PE)

In addition, a student should satisfactorily complete Audit courses (AC) minimum 2 No's prescribed in the curriculum. Audit courses are non-credit courses.

A.1. Compulsory courses consisting of

- a. **Professional Core (PC)**) courses introducing the students the foundation of architectural topics
- b. **Building Science and Applied Engineering (BS& AE)** courses informs the Professional Core courses
- c. **Skill Enhancement (SEC)** Courses nurtures skill of the
- d. **Professional Ability Enhancement (PAEC)** Courses

A.2. Elective Course enables students to take up a course of their own interest and facilitates students a freedom in selecting courses.

- a. **Open Elective** Courses enables an exposure to some other discipline
- b. **Professional Elective** Courses supportive to the core discipline of the study or provides an extended scope; may be very specific; specialised; advanced.

A.3. Audit Course courses consisting of

- a. Disaster Management
- b. Environmental Studies

B. Credits:

Credits are the weightages are assigned to the courses based on the following general pattern:

1. lecture period
1 credit
2. Periods Lab/Workshop/ Tutorial 1
credit
3. Period of Design/ Construction/ Practical Training/ Thesis 1
credit

B.1.The curriculum for B. Arch. Programme is designed to have a minimum of 296 credits + 2Non CGPA credits distributed across ten semesters of study for the award of degree.

B.2.A student must earn a minimum number of credits under each category as shown in Table 1 and also a minimum total of credits (296 credits + 2 Non CGPA courses) for the award of B. Arch degree.

Table1: Distribution of credits

No	Category	Code	Credits	Percentage
1	Professional Core	PC	149	50.34%
2	Building Science and Applied Engineering	BSAE	60	20.27%
3	Skill Enhancement Course	SEC	17	05.74%
4	Professional Ability Enhancement Courses	PAEC	34	11.49%
5	Open Elective	OE	10	03.38%
6	Professional Electives	PE	26	8.78%
	Total Credits		296	100.00%
		NON CGPA		
	Audit courses		----	---

Structure & Examination Pattern of First Year B.Arch.

Semester I							Total Duration-30 hrs./Week					
							Total Credits -30					
Course Code	Course Category	Course	Teaching Scheme				Examination Scheme (Marks)				Credits	
			(in hours/week)									
			L	SP	W	Total	IA	UE			Total	Total
								TP	SO	SS		
KHMU11	PC	Architectural Design-I	2	2	2	6	40	-	60	-	100	6
KHMU12	BSAE	Building Construction and Materials-I	2	-	4	6	40	-	60	-	100	6
KHMU13	BSAE	Theory of Structures-I	1	-	1	2	40	-		60	100	2
KHMU14	PC	History of Architecture -I	2	-	1	3	40	60	-	-	100	3
KHMU15	PC	Architectural Drawings and Graphics-I	1	-	4	5	40	60	-	-	100	5
KHMU16	PC	Workshop	1	-	2	3	40	-	-	60	100	3
KHMU17	PC	Basic Design-I	1	-	2	3	40	-	60	-	100	3
KHMU18	OE	Elective I	1	-	1	2	100	-	-	-	100	2
		Total				30	380	120	180	120	800	30
Notations: L-Lectures, SP-Studio project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination TP- Terminal Paper ,SS-Sessional ,SO -Sessional Oral												
PC: Professional Core Course; BSAE: Building Science and Applied Engineering Course ,OE: Open Elective												

Structure & Examination Pattern of First Year B. Arch

Semester-II							Total Duration-30 hrs./Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE		Total		
								TP	SO		SS	
KHMU21	PC	Architectural Design-II	2	2	2	6	40	-	60	-	100	6
KHMU22	BSAE	Building Construction and Materials-II	2	-	4	6	40	-	60	-	100	6
KHMU23	BSAE	Theory of Structures-II	1	-	1	2	40	-	-	60	100	2
KHMU24	PC	History of Architecture -II	2	-	1	3	40	60	-	-	100	3
KHMU25	PC	Architectural Drawings and Graphics-II	1	-	4	5	40	60	-	-	100	5
KHMU26	PC	Climatology	2	-	1	3	40	-	-	60	100	3
KHMU27	PC	Basic Design -II	1	-	2	3	40	-	60	-	100	3
KHMU28	OE	Elective II	1	-	1	2	100	-	-	-	100	2
		Total				30	380	120	180	120	800	30
Notations: L-Lectures, SP-Studio project, W-Workshop/Studio Exercises												
IA: Internal Assessment, UE: University Examination, TP- Terminal Paper, SS-Sessional, SO -Sessional Oral												

PC: Professional Core Course, BSAE: Building Science and Applied Engineering Course, OE: Open Elective

Structure & Examination Pattern of Second Year B.Arch.

Semester-III							Total Duration-30 hrs./Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE				Total
								TP	SO	SS		
KHMU31	PC	Architectural Design -III	1	4	1	6	40	-	60	-	100	6
KHMU32	BSAE	Building Construction and Materials-III	2	-	4	6	40	-	60	-	100	6
KHMU33	BSAE	Theory of structures-III	2	-	-	2	40	60	-	-	100	2
KHMU34	PC	History of Architecture-III	2	-	1	3	40	-	60	-	100	3
KHMU35	PC	Architectural Drawings and Graphics-III	1	-	4	5	40	-	-	60	100	5
KHMU36	PC	Building services-I	2	-	1	3	40	60	-	-	100	3
KHMU37	SEC	Computer Applications in Architecture-I	1	-	2	3	100	-	-	-	100	3
KHMU38	PE	Elective-III	1	-	1	2	100	-	-	-	100	2
		Total				30	440	120	180	60	800	30
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment, UE: University Examination, TP- Terminal Paper, SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course, BSAE: Building Science and Applied Engineering Course, SEC: Skill Enhancement Course, PE: Professional elective												

Structure & Examination Pattern of Second Year B.Arch.

Semester-IV							Total Duration-30 hrs/Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE				Total
								TP	SO	SS		
KHMU41	PC	Architectural Design-IV	1	4	1	6	40	-	60	-	100	6
KHMU42	BSAE	Building Construction and Materials-IV	2	-	4	6	40	-	60	-	100	6
KHMU43	BSAE	Theory of Structures-IV	2	-	-	2	40	60	-	-	100	2
KHMU44	PC	History of Architecture-IV	2	-	1	3	40	-	60		100	3
KHMU45	BSAE	Surveying and Levelling	1	-	4	5	40	-	-	60	100	5
KHMU46	BSAE	Building Services-II	2	-	1	3	40	60	-	-	100	3
KHMU47	SEC	Computer Applications in Architecture-II	1	-	2	3	100	-	-	-	100	3
KHMU48	PE	Elective-IV	1	-	1	2	100	-	-	-	100	2
	AC	Environmental Studies	-	-	-	-	-	-	-	-	-	-
		Total				30	440	120	180	60	800	30

Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises

IA: Internal Assessment, UE: University Examination, TP- Terminal Paper, SS-Sessional, SO -Sessional Oral
 PC: Professional Core Course, BSAE: Building Science and Applied Engineering Course, SEC: Skill Enhancement Course, PE: Professional Elective, AC: Audit Course

Structure & Examination Pattern of Third Year B. Arch

Semester-V							Total Duration-30 hrs/Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE				Total
								TP	SO	SS		
KHMU51	PC	Architectural Design-V	1	6	1	8	40	-	60	-	100	8
KHMU52	BSAE	Building Construction and Materials-V	2	-	3	5	40	60	-	-	100	5
KHMU53	BSAE	Theory of Structures-V	1	-	1	2	40	-	-	60	100	2
KHMU54	PC	Specification Writing	2	-	1	3	40	60	-	-	100	3
KHMU55	PC	Landscape Architecture -I	1	1	1	3	40	-	60	-	100	3
KHMU56	BSAE	Building Services-III	2	-	1	3	40	-	-	60	100	3
KHMU57	SEC	Working Drawing -I	1	-	3	4	40	-	60	-	100	4
KHMU58	PE	Elective-V	1	-	1	2	100	-	-	-	100	2
		Total				30	380	120	180	120	800	30
Notations: L-Lectures, SP-Studio project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course; BSAE: Building Science and Applied Engineering Course,SEC:Skill Enhancement Course,PE: Professional Elective												

Structure & Examination Pattern of Third Year B. Arch

Semester-VI							Total Duration-30 hrs/Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)					Credits
			L	SP	W	Total	IA	UE			Total	
								TP	SO	SS		1
KHMU61	PC	Architectural Design-VI	1	6	1	8	40	-	60	-	100	8
KHMU62	BSAE	Building Construction and Materials-VI	2	-	3	5	40	60	-	-	100	5
KHMU63	BSAE	Theory of Structures-VI	1	-	1	2	40	-	-	60	100	2
KHMU64	PC	Estimation and Costing	2	-	1	3	40	60	-	-	100	3
KHMU65	PC	Landscape Architecture -II	1	1	1	3	40	-	60	-	100	3
KHMU66	BSAE	Building Services-IV	2	-	1	3	40	-	-	60	100	3
KHMU67	SEC	Working Drawing- II	1	2	1	4	40	-	60	-	100	4
KHMU68	PE	Elective-VI	1	-	1	2	100	-	-	-	100	2
	AC	Disaster Management	-	-	-	-	-	-	-	-	-	-
		Total				30	380	120	180	120	800	30
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course, BSAE: Building Science and Applied Engineering Course, SEC: Skill Enhancement Course, PE: Professional Elective, AC: Audit Course												

Structure & Examination Pattern of Fourth Year B. Arch

Semester-VII							Total Duration-30 hrs/Week					
							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE			Total	Total
								TP	SO	SS		
KHMU71	PC	Architectural Design-VII	1	8	1	10	40	-	60	-	100	10
KHMU72	PC	Interior Design	1	2	1	4	40	-	60	-	100	4
KHMU73	PC	Urban Planning	1	-	2	3	40	-	60	-	100	3
KHMU74	PAEC	Research in Architecture	2	-	2	4	40	-	-	60	100	4
KHMU75	SEC	Advance Computer Applications in Architecture	1	-	2	3	40	-	60	-	100	3
KHMU76	PE	Elective-VII	1	-	2	3	40	-	-	60	100	3
KHMU77	PE	Elective-VIII	1	-	2	3	40	-	-	60	100	3
		Total				30	280	Nil	240	180	700	30
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, TP: Terminal Paper,SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course;PAEC: Professional Ability Enhancement Course,SEC:Skill Enhancement Course,PE: Professional Elective												

Structure & Examination Pattern of Fourth Year B. Arch

Semester-VIII							Total Credits -30					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)					Credits
			L	SP	W	Total	IA	UE			Total	
								TP	SO	SS		
KHMU81	PAEC	Practical Training	-	-	-	-	-	-	100		100	24
KHMU82	OE	Self-Study	-	-	-	-	-	-		100	100	6
							Nil	Nil	100	100	200	30
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, TP: Terminal Paper, SS-Sessional, SO -Sessional Oral												
PAEC: Professional Ability Enhancement Course, OE: Open Elective												
Note 1: For practical training, a student has to undergo 16 weeks of training per semester.												
Note 2: The work from practical training will be assessed after the student completes the internship in this semester.												
Note 3: Validity of training shall be only for a year after completion of training.												

Structure & Examination Pattern of Fifth Year B. Arch

Semester-IX							Total Duration-28hrs/Week					
							Total Credits -28					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE				Total
								TP	SO	SS		
KHMU91	PC	Advanced Architectural Design (Context Studio)	2	6	4	12	40	-	60	-	100	12
KHMU92	PC	Capstone Project	1	2	1	4	40	-	60	-	100	4
KHMU93	PAEC	Research Project	1	-	3	4	40	-	-	60	100	4
KHMU94	PAEC	Professional Practice	1	-	1	2	40	-		60	100	2
KHMU95	PE	Elective-IX	1	-	2	3	40	-	60	-	100	3
KHMU96	PE	Elective-X	1	-	2	3	40	-	60	-	100	3
		Total				28	240	Nil	240	120	600	28
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, TP: Terminal Paper, SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course,PAEC: Professional Ability EnhancementCourse, PE: Professional Elective												

Structure & Examination Pattern of Fifth Year B. Arch

Semester-X							Total Duration-28hrs/Week					
							Total Credits -28					
Course Code	Course Category	Courses	Teaching Scheme (in hours/week)				Examination Scheme (Marks)				Credits	
			L	SP	W	Total	IA	UE			Total	
								TP	SO	SS		
KHMU101	PC	Architectural Design Project	1	12	5	18	40		60		100	18
KHMU102	PC	Seminar in Architecture	1	-	3	4	100				100	4
KHMU103	PE	Elective-XI	1	-	2	3	40		60		100	3
KHMU104	PE	Elective-XII	1	-	2	3	40		60		100	3
		Total				28	220	Nil	180	Nil	400	28
Notations: L-Lectures, SP-Studio Project, W-Workshop/Studio Exercises												
IA: Internal Assessment; UE: University Examination, TP: Terminal Paper, SS-Sessional, SO -Sessional Oral												
PC: Professional Core Course, PE: Professional Elective												

GUIDELINES FOR PAPER-SETTING SYLLABUS CBCS-2020

1. Question paper to cover questions from the entire syllabus.
2. All UE theory papers are for a maximum 60 marks.
3. Duration:
 - a. 2&1/2 hrs. for writing papers
 - b. 3hrs. for drawing papers.
4. There will be two sections of max. Marks 30 each.
 - a. Section-I from Units-I,II& III of syllabus
 - b. Section-II from Units-IV,V& VI of syllabus
5. There will be four questions in each section of 10 marks each.
6. Maximum marks for each question will be in whole numbers & not in fractions.
7. In each Section following pattern will be followed:

Section –I

 - a. Question no. 1 is compulsory
 - b. Attempt any Two questions out of Question no. 2, 3,4.

Section –II

 - a. Question no. 5 is compulsory
 - b. Attempt any Two questions out of Question no. 6, 7,8.
8. In each section 20% marks will be assigned for Analytical questions i.e in each section out of 30 marks 6 marks are assigned for Analytical component. This component will be in compulsory questions i.e Question no.1 and Question no.5.

LIST OF ELECTIVES

Following is the list of electives under various streams for each semester to facilitate choice to learners in selecting courses of their own interest. However, the list given is only suggestive and can expand or modify it for enrichment of the course. The college will offer electives based upon the availability of resources in the college, provided minimum 20 students choose the particular elective. However colleges have to ensure that the student does not repeat a particularelective. Wide range of 'Open Electives' are offered for Semester I , II & VIII as below. Students have to choose any one from the list.

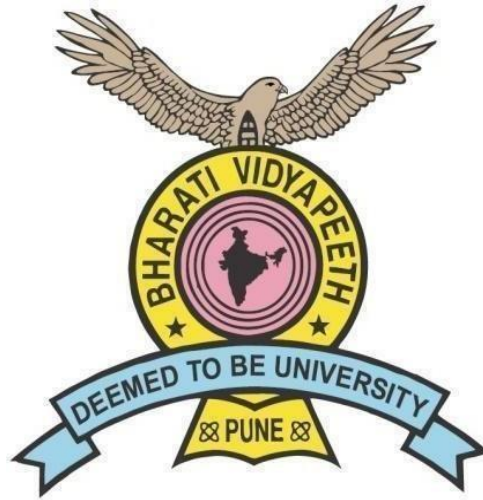
Semesters	Open Electives
Sem-I	Physical Education and Yoga
	Performing Arts
	Culinary Art
	Stress Management
	Community Engagement
	Pottery
Sem-II	Architectural Photography
	Personality development and Communication Skills
	Foreign Languages
	Calligraphy Techniques
	Ayurveda as a lifestyle
	Cyber Security
Sem.VIII	Certificate Course
	Study in their interest area

For Sem. VIII students can take up certificate courses such as MOOC, SWAYAM etc. It could be an online course, or conduct study in their interest area.

From Sem-III to Sem X, students can choose electives as per structure of the syllabus from any of the three streams (Professional Electives) mentioned in the table below. A student may adhere to a particular stream of electives of his/her choice and nurture his/her area of interest and develop his/her expertise across semesters. In the semesters where two electives are offered per semester, students have to choose them from two different streams.



Semesters	Design	Technology and Management	Allied (Art, legalities, culture, environment, etc.)
Sem-III	Vernacular Architecture	Alternative Building Materials and Technology	Sketching
	Theory of Design	Presentation Techniques in Architecture	Horticulture
Sem-IV	Climate Responsive Building Design	Sustainable Water Management	Visual Communication
	Graphic Design	Glass in Architecture	Introduction to Indology
Sem-V	Universal Design	Building Automation	Rural development
	Light in Architecture	Sustainable Waste Management	Architectural Journalism
	Water in Architecture	Cost Effective Construction	Ekistics
Sem-VI	Furniture Design	Auditorium Acoustics and Services	Affordable Housing
	Gendered Spaces	Fenestrations in Buildings	Building Economics
	Architects and Their Philosophies	Facility Management	Introduction to Archaeology
Sem-VII	Product Design	Long Span Structures	Gender in Architecture
	Architectural Conservation	Disaster Resistant Structures	Behaviour Psychology
	Healthcare Design	Prefabricated and Prestressed Structures	Ergonomics
	Critical Thinking of Modern Architecture	Steel Structures	Housing Laws and Policies
			Traffic Awareness - Road Safety and Civic Sense
Sem-IX	Set Design	Office Management	Study of Cities
	Hospitality Design	Real Estate Management	Intellectual Property Rights
	Urban Design	Fire Fighting Systems in Buildings	Art in Architecture
	Landscape Urbanism	Pneumatic Structures	Urban Infrastructure Planning
Sem-X	Digital Architecture	Construction Management	Cultural Landscapes
	Industrial Design	Intelligent Building Systems	Geographic Information System
	Modular Furniture Design	Valuation	Legalities in Architectural Profession
	Specialised Architecture(Defence/Airports/Stadiums)	Specialised Services in Buildings	Green Building Rating Systems
	*Ancient Building Science	* Modular Coordination	* Study of Iconography in Temples

Note : * As per BOS resolution 3a (dated 4th June 21) ,three elective courses have been shifted from fourth semester to tenth semester. As per BOS resolution 2 (dated 13 February 23) Elective 'Design Management' and 'Business Management' has been added under Technology and Management stream and 'Artificial intelligence and user experience under Allied stream.



F.Y. B. Arch (CBCS 2020)
(Contents Semester I to II)
For
Bachelor of Architecture (B. Arch) Programme

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune

 Prof. Dr. Shivajirao Kadam Chancellor Prof. Dr. M. M. Salunkhe Vice-Chancellor	Bharati Vidyapeeth (Deemed to be University) Pune, India, Founder Chancellor : Dr. Patangrao Kadam ★ Accredited with 'A' Grade (2017) by NAAC ★ ★ Category I University Status by UGC ★ ★ NIRF Ranking 66 ★ "Social Transformation Through Dynamic Education"	 Dr. Vishwajeet Kadam Pro Vice-Chancellor G. Jayakumar Registrar
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NOTIFICATION NO. 1055

It is hereby notified for the information of all concerned that the proposal to revise the course structure, syllabus and rules of examinations of B.Arch. programme proposed by the concerned Board of Studies and recommended by the Faculty of Engineering and Technology is considered by the authorities of the University.

The authorities of the University have approved the course structure, rules of examinations and 1st year syllabus of B.Arch. programme offered under the Faculty of Engineering and Technology to be implemented from the academic year 2020-21 :

Ref. No. BVDU/ 2020-21/1786
Date : November 5, 2020

G. Jayakumar
Registrar

- 1. The Principal, College of Architecture, Pune 43
- 2. The Dean, Faculty of Engineering and Technology, Pune 43
- 3. The Controller of Examinations, BVDU
- 4. The IT Cell for uploading in the Website.

Adm/Syllabus/Excellence/
CSA ME

Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune-43.
Inward No. <u>181</u>
Date: <u>01/11/2020</u>
Sign: _____

SEMESTER I

First Year B Arch.

Architectural Design-I

CourseCode:KHMU11	Course Category: Professional Core		Semester: I
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	2	Sessional Oral (SO)	60marks
Workshops or studio exercises / week	2	Sessionals (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To apply knowledge gained in other subjects and present them in graphic form using manual medium.
2. To imbibe the importance of pre-study in design process
3. To provide knowledge and understanding of design with special attention to design fundamentals and orientation

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Define anthropometry and recognize the importance of cardinal directions in design.
2.	Understanding	Comprehend design fundamentals in relation to space design.
3.	Applying	Develop visualization of liveable spaces by understanding relationship between the activities and spaces through case studies and site visits.
4.	Analysing	Analyse the aspects related to function, space, structure, and aesthetics.
5.	Evaluating	Relate knowledge in the domain of fundamentals of design
6.	Creating	Design a single activity space and create final project and model

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of Design Fundamentals <ul style="list-style-type: none">- Study of anthropometry, (study of basic human activities in Indian and Global context)- Study of function and circulation (Relationship between function and space)	12
Unit -II	Study of orientation of buildings <ul style="list-style-type: none">- Study of cardinal and ordinal directions- Study of building orientation with respect to basics of sun and wind- Understanding the preferred/ non preferred, favorable/non favorable orientation with respect to cardinal directions and climate	12
Unit -III	Pre-study: Learning from primary and secondary resources <ul style="list-style-type: none">- Case-studies and site visits- Books, reports, articles- Films and documentaries	24
Unit-IV	Architectural Design <ul style="list-style-type: none">- Single activity architectural design project (approximately 50 sqm.), with application of the learning's from study of design fundamentals, study of cardinal directions, climate, and the pre-study.	30
Unit-V	3-D models <ul style="list-style-type: none">- Study models- Physical model of the final design proposal with site development	12
Total Contact Hours		90

Learning Resources:

1.	Akiko Busch (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i> , New Jersey, John Willy and Sons
3.	Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i> , New Jersey, John Willy and Sons
4.	Krishnan Arvind (2017), <i>Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings</i> , McGraw Hill Education
5.	Neufert Ernst (1970) <i>Neufert Architects data</i> , Bauwelt-Verlag (German 1 st Ed.), Lockwood (English 1 st Ed.)
6.	Nick Bunn (2010) <i>Architectural Model Making</i> , London, Laurence King Publishing
7.	Pandya Yatin (2014) <i>Elements of Space Making</i> , Ahmedabad, Mapin Publishing
8.	Pramar V. S. (1973) <i>Design Fundamentals in Architecture</i> , Somaiya Publication
9.	Rapoport Amos (1969), <i>House, form and culture</i> , Pearson
10.	Thakkar Jay, Morrison Skye, (2008) <i>Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh</i> , SID research Cell, CEPT University

First Year B Arch.

Building Construction and Materials-I

CourseCode:KHMU13	Course Category: BSAE		Semester: I
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60marks
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To enable students to understand materials, principles and methods of construction
2. To cover the breadth of students including components and systems of buildings

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Define various components of building and know technical terms, the different materials available for masonry work
2.	Understanding	Understand the concept of load transmission and distinguish load bearing and framed structure
3.	Understanding	Describe purpose ,methods and types of finishes
4.	Applying	Apply knowledge gained in Theory of Structureand develop understanding about basic principles of construction method
5.	Analysing	Analyse Different materials in terms of properties, types, application in design ,market forms available ,advantages and disadvantages etc
6.	Evaluating	Compare different types of materials in masonry work
7.	Creating	Design masonry element and entrance gate applying alternative materials and methods of construction
8.	Creating	Create drawings,models and relate structural behaviourism and construction techniques

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction Introduction to building construction as course and its relevance to Architectural design. <ul style="list-style-type: none"> - Introduction to various components of building from foundation to roof. - Structural elements of load bearing and framed structure and its differences 	7
Unit -II	Materials <ul style="list-style-type: none"> - Properties, sustainability aspects, various types, cost, application in buildings, defects and strengths, market survey of bricks , stones ,cement, sand, aggregates, mortar and lime. 	7
Unit -III	Finishes <ul style="list-style-type: none"> - Pointing: Purpose and types - Plastering: Method and types i.e. neeru faced, sand faced, rough cast, pebble finish and all proprietary types. Innovative materials used for pointing and plastering	7
Unit-IV	Foundation <ul style="list-style-type: none"> - Excavation: purpose and types, plinth formation - Introduction to shallow foundation - Strip foundation for a load bearing structure in stone and brick upto plinth level including plinth formation - Foundation for brick piers, entrance steps, compound walls. 	21
Unit-V	Masonry <ul style="list-style-type: none"> - Fundamentals, principles of load bearing construction for medium rise structures using brick, stone, concrete blocks, solid blocks, hollow blocks, cavity blocks etc. - Introduction to various types of brick masonry. - Bonds: English, Flemish, header, stretcher, garden wall, rat trap and other types. - Junctions: Tee, crossed and right angled - Introduction to stone masonry and its types: dry rubble, uncoursed rubble, random rubble, squared, polygonal, etc. - Composite masonry 	31
Unit-VI	Entrance gate and Fencing <ul style="list-style-type: none"> - Entrance gate - Constructional details of entrance gate in a compound wall of following types: Sliding Gate with floor channel, Side hung, side hung with wicket gate. - Fencing - Construction in different materials like Barbed wire, Chain link, Wire mesh, R.C.C. Grills, M.S. Grills etc. 	17
Total Contact Hours		90

Learning Resources:

1.	Rangwala S.C. (2007) Engineering Materials, Gujarat, Charator Publication House
2.	Duggal S.K. (2009) Building materials, New Delhi, New Age International
3.	Varghese P.C. (2005) Building Materials, New Delhi, Prentice Hall of India Pvt. Ltd.
4.	Duggal S.K. (1997) Building Materials, New Delhi, Oxford and IBH publishing Co. Pvt. Ltd.
5.	Spence R.F. and Cook D.J. (1983) Building Materials in Developing Countries, New York, John Wiley and Sons.
6.	W.B. McKay (1981) Building construction Vol. II, UK, Longmans Green and Co.
7.	Barry (1958) The construction of buildings, Vol. I, Blackwell science
8.	Roy Chudley, Goger Greeno (1988), Buildings Construction handbook, Routledge

First Year B Arch

Theory of Structures-I

CourseCode:KHMU13	Course Category: BSAE		Semester: I
Credits :	2	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises/ week	1	Sessionals(SS)	60marks
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	6 Hours

Course Objectives:

1. To understand the structural concepts and behaviour of structural element

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Recognize the significance of the main structural elements in structural analysis
2.	Understanding	Explain structural concepts, fundamentals of structure and describe of the various loading conditions acting on the structure
3.	Understanding	Illustrate the concept of free body diagram of structures and structural elements
4.	Applying	Calculate Self weight, resolution of forces, centre of gravity, moment of inertia, material constants for all types of structures, and stress calculations of structural members having different material properties
5.	Applying	Develop an ability to analyse internal response of structure
6.	Analysing	Compare response of structural system for various materials
7.	Evaluating	Evaluate the behaviour of structural elements of ancient and modern structures
8.	Creating	Design stepped foundation, wall of uniform thickness and variable thickness and relate principles of this subject to the other subjects such as Building Construction, Architectural design, Architectural drawing and graphics, History of Architecture

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to fundamental concepts of structure:- Introduction to fundamental concepts of Applied Mechanics relevant to structures and characteristics of material like unit weight, elasticity, plasticity, ductility, hardness. Understanding of rigid body, deformable body, force systems, characteristics of forces, transmissibility, types of structures. Concept of tension, compression in structures	04
Unit -II	Resolution of forces :- Types of loads and moment a) calculation of self-weight based on density for load bearing elements. b) Resultant concurrent force system with simple practical examples. c) Concept of moment and resultant of non-concurrent force system with simple practical examples	06
Unit -III	Equilibrium of forces acting on beam:- Introduction to i) Equilibrium conditions of force systems. ii) Types of loads -point loads, uniformly distributed load(udl), uniformly varying load(uvl), types of supports (hinge, simple, roller, fixed) , types of beams (simply supported, cantilever, overhanging, fixed, continuous) iii) Support reactions in beams.	06
Unit-IV	Centroid & Centre of Gravity: Importance and application of centroid and centre of gravity for plane sections like Rectangle, circle, semicircle, triangle. iii) Calculation of centroid for shapes-- C,T,L,I	04
Unit-V	Moment of Inertia: Moment of Inertia For standard sections, Parallel axis theorem, Perpendicular axis theorem, Radius of gyration. Moment of Inertia of sections considered for centre of gravity (Unit IV).Importance and Application	04
Unit-VI	Simple stress & Strain:- Concept of Simple stress and strain. Calculation of self-weight for load bearing elements and downward soil pressure due to the same. Simple numerical based composite (modular ratio) and compound elements. Behaviour of ductile and brittle material in terms of stress and strain curve. Introduction to elastic constants and its significance. Definition of fatigue, creep. Introduction to flinched beams	06
Total Contact Hours		30

Learning Resources:

1.	Beer and Johnston,(2008).Mechanics of Materials.NewDelhi,Tata McGraw-Hill
2.	Mario Salvadori.(1980).Why buildings stand up:The strength of architecture. McGraw-Hill
3.	S.B.Junnarkar&Dr.HJ Shah,(2012).Mechanics of Structures Vol. I & II.Anand,CharotarPublishing
4.	KhurmiR.S.(2014).Strength of Materials.NewDelhi,S.Chand& Company Ltd
5.	DongreA.P.(2011).Strength of Materials.Pune/Hyderabad,Scitech Publications

First Year B Arch.

History of Architecture-I

CourseCode:KHMU14	Course Category: Professional Core		Semester: I
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	60marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	9 Hours

Course Objectives:

1. To learn from the wisdom of traditional knowledge systems.
2. To imbibe the fundamental knowledge of the built environment
3. To study the history of architecture as a response to climate, culture and socio political conditions.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Identify issues with reference to cultures, civilizations, and settlements across the world at different periods of time
2.	Remembering	Know technology and its impact on built environment and building form
3.	Understanding	Understand the development of architecture as a process through a holistic approach of contextual and cultural evolution
4.	Understanding	Differentiate between various styles and elements of development and describe prominent historic buildings
5.	Applying and Analysing	Develop ability to analyse the evolutionary aspects of stage of progress
6.	Evaluating	Compare architectural style across culture of that time with reference to location -geography, Social Systems, Religion ,climate, art etc.
7.	Creating	Derive materials, construction techniques in design from historic civilization

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Prehistoric Housing forms in the initial phase: Cave shelters- (suggestive examples at Lascaux, Terra Amata etc.) Community structures: (suggestive examples Menhir, dolmen, gallery and passage graves, Stonehenge, Ggantija Malta etc.)</p>	6
Unit -II	<p>River Valley Civilizations –Asia Introduction to development of the settlements - location, social and cultural aspects, climate, construction techniques, building materials, building typologies and architectural characteristics, settlement principles etc - Yellow River, Indus River</p>	9
Unit-III	<p>Vedic Architecture Vedic culture and settlement planning layouts, City Planning in later Vedic period and Buildings and construction techniques. Buddhist Architecture Introduction to the Evolution and development of Major typologies like Stambha, Chaitya, Vihara, Stupa. Development of Chaitya arch(suggestive examples Ashokan Stambhas, Lomas Rishi Cave, The Great Stupa at Sanchi, Chaitya Hall at Karli, Chaitya and Viharas at Verul and Ajanta etc)</p>	7
Unit-IV	<p>River Valley Civilizations -Western Introduction to development of the settlements - location, social and cultural aspects, climate, construction techniques, building materials, building typologies and architectural characteristics, settlement principles etc - Nile River, Tigris River</p>	7
Unit-V	<p>Greek Civilization Introduction to the Social and cultural Systems, political scenario, History and evolution of Architectural typologies, Characteristics of Buildings, construction technology and elements evolved like Classical Orders, Optical corrections etc. (Suggestive examples Acropolis, City of Athens Temples, Theatres, Agora, Stoa, Council Halls etc)</p>	8
Unit-VI	<p>Roman Civilization Introduction of the History, evolution and characteristics Elements of special attributes. Introduction to the, Social and cultural Systems, political scenario, History and evolution of Architectural typologies, Characteristics of Buildings, construction technology and elements evolved like Arches, arcuated construction, bridges, aqueducts, etc(suggestive examples City of Rome ,Temples- Pantheon, Basillica at Trajan, Amphitheatre, Hippodrome, Circus, Palaces-hydrrian’s villa , Thermae at Carcallaetc</p>	8
Total Contact Hours		45

Learning Resources:

1.	Sir Banister Fletcher, (1999) A History of Architecture, Indian Edition. Delhi, CBS Publications.
2.	Percy Brown,(1983) Indian Architecture (Hindu And Buddhist). Bombay, Taraporevala and Sons
3.	Denis Montagnon, (2001) Rome . ISBN 3-8228-5870-6. Germany, TashchenGmnH Satish Grover, (2003) The Architecture of India (Buddhist and Hindu Period). New Delhi, Vikas Publishing Housing Pvt. Ltd.
4.	Leland M Roth ,(1994) Understanding Architecture: Its Elements, History and Meaning. Craftsman House;
5.	Pier Luigi Nervi, General Editor, (1972) History of World Architecture – Series. New York, Harry N. Abrams Inc. Pub
6.	Burns, Ralph, Lerner, Meacham, (1991) World Civilizations. First Indian Edition, Delhi, Goyal Saab Publishers and Distributors.
7.	Roger Smith, (1987) An Illustrated history of Architectural Styles. Omega Books Ltd. SebastianoSerlio,(1982) The five books on architecture. New York, Dover Publication Inc.
8	SebastianoSerlio,(1982) The five books on architecture. New York, Dover Publication Inc
9	Satish Grover, (2003) The Architecture of India (Buddhist and Hindu Period). New Delhi, Vikas Publishing Housing Pvt. Ltd.

First Year B Arch.

Architectural Drawing and Graphics-I

CourseCode:KHMU15	Course Category: Professional Core		Semester: I
Credits :	5	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	60marks
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	90 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To develop visualisation and presentation skills as tools for creative thinking and representation of ideas and concepts
2. To acquire effective communication in graphical form in Architecture
3. To impart basic knowledge and skill to draft a drawing manually.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Know architectural drawing techniques using drafting tools.
2.	Remembering	Acquire vocabulary and grammar such as scale, annotations, labelling, dimensioning etc.
3.	Understanding	Understand the concept of orthographic projection, surface development.
4.	Applying	Use freehand techniques for preparing drawings and develop perception and presentation of different forms
5.	Analysing and Evaluating	Analyse and relate Architectural Drawing Graphics with Architectural Design, Building Construction, Working Drawing etc
6.	Creating	Create conceptual and presentation drawings for various purposes

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to graphic language and its components <ul style="list-style-type: none"> - Introduction to instruments - Line types: meaning and application - Architectural lettering and dimensioning techniques and their role and application in composition of drawings with various examples - Architectural annotations and conventions 	12
Unit -II	Orthographic Projections <ul style="list-style-type: none"> - Geometrical construction, planar geometry - Method of Orthographic projections - Drawing 2-dimensional drawings from 3-dimensional objects 	18
Unit -III	Surface Development <ul style="list-style-type: none"> - Surface Development of various three-dimensional objects 	13
Unit-IV	Study of Graphical Scales <ul style="list-style-type: none"> - Introduction to graphic scale and their applications - Scaled enlargement and reduction of simple objects and site plans of complex shapes - Scaled drawings (plan/sections and elevations) of complex objects/ simple building of sufficient size to demonstrate use of various scales, conventions and standard annotations 	9
Unit-V	Sketching <ul style="list-style-type: none"> - Introduction to architectural sketching and principles of free hand sketching such as proportions, light and shade: with primary thrust on sketching of building elements and built/un-built environment. 	8
Unit-VI	Sections: from simple geometrical elements to complex architectural elements <ul style="list-style-type: none"> - Graphical and visual communication through sections of geometric forms along with the understanding of the line weights, material indications, etc. - Graphical and visual communication through sections of architectural elements / building along with the understanding of the line weights, material, indications, etc 	15
Total Contact Hours		75

Learning Resources:

1.	F. D K. Ching (2009) Architectural Graphics, New Jersey, John and Wiley and Sons.
2.	Manual of Section, David J. Lewis, Marc Tsurumaki, and Paul Lewis.
3.	Architectural Drawing Course: Tools and Techniques for 2D and 3D Representation, by <i>Mo Zell</i> .
4.	N.D.Bhatt (2012) Engineering Drawing, Gujrat, Charotar Publishing House.
5.	Hugh C. Browning (1996) The Principles of Architectural Drafting, New York, Watson-Guptill Publications.
6.	Calvin F. Schmid, Stanton E. Schmid, (1954) Handbook on Graphic Presentation, New York, The Ronald Press Company
7.	David Littlefield (2012) Matric Handbook, London and New York, Routledge Taylor and Francis Group.
8.	Sleeper R.(2000)Architectural Graphic Standards, New York, John Wiely and Sons.

First Year B Arch.

Workshop

CourseCode:KHMU16	Course Category: Professional Core		Semester: I
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	2	Sessionals(SS)	60
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To introduce various types of models at appropriate scales such as site model, study model, block model, finished presentation models
2. To introduce students to various materials, tools and techniques used in making architectural models.
3. To introduce students to various skills such as joinery, cutting, finishing in carpentry, smithy.

Course Outcomes:

CO No.	Psychomotor levels	On successful completion of course the learner will be able to:
1.	Imitation	Observe the nature and texture of different materials
2.	Manipulation	Replicate forms in drawing by making models
3.	Precision	Choose tools and joinery techniques required for model making
4.	Precision	Integrate two dimensional drawing and three dimensional form
5.	Articulation	Constructor Compose three dimensional forms using different model making materials and equipment in different scale
6.	Naturalisation	Make Everyday objects, some building elements ,building forms with a wide variety of available materials and handle simple tools in carpentry

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Materials for model making: Introduction to various materials like various types of papers, mount boards, softwood (balsa), cork, clay etc for architectural model making.	6
Unit -II	Tools and techniques in model making Introduction to various tools and techniques cutting, scoring, folding and gluing techniques, using templates, measuring aids, to build surfaces and simple/ solids such as cubes, prism, cylinders, pyramids, cones, spheres etc or interpenetrated forms.	9
Unit-III	Adv. Materials, methods and tools: Using materials such as plastics, films, plaster of paris, clay, acrylic, wax, metals, glass, fabric etc and their moulding, scooping, cutting, joining methods etc	6
Unit -IV	Wood and metal work: Exercises in cutting and joinery with planers, saw, lathe, and jigs; Joinery details in wood, metal, blocks, pipes, plates, etc, composition of basic and complex geometrical forms.	9
Unit-V	Finishing: Exercises in finishing with planers, sander; Finishing surfaces with various protective coats, paints, varnishes, oils etc	9
Unit-VI	Prototyping and advanced modelling: Introduction to model making using machines - explore laser cutting, acid etching, stereo lithography, 3D printing, etc. Introduction to various types of model making for Architectural studies like block model, working models, contour models, site models, openable models, service models etc.	6
Total Contact Hours		45

Learning Resources:

1	Engel, P. (1989). Folding the Universe: Origami from Angelfish to Zen. Vintage.
2	Janke, R. (1978). Architectural models/Architekturmodelle (No. 72.027). Academy Editions,.
3	Mills, C. B. (2011). Designing with models: a studio guide to architectural process models. John Wiley & Sons.
4	Taylor, J. R., & Taylor, J. R. (1971). Model building for architects and engineers. McGraw-Hill Companies.

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Basic Design -I

CourseCode:KHMU17	Course Category: Professional Core		Semester: I
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60marks
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To develop the basic understanding of the fundamentals of design
2. To provide knowledge and understanding of elements and principals of design; its importance

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Know elements of Design
2.	Understanding	Understand Effects of scale, the concept of form, space and structure through creative thinking
3.	Applying	Develop Lateral thinking and apply the principles of design
4.	Analysing	Analyse aspects of form, space and aesthetics
5.	Evaluating	Appraise design forms in terms of visual character and critique basic design composition
6.	Creating	Create two dimensional and three dimensional composition with various media

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Elements of Design: Introduction to: <ul style="list-style-type: none"> - Different Elements of design - Fundamentals of Design 	08
Unit -II	Scale, Proportion: <ul style="list-style-type: none"> - Proportion & scale: Material proportions, structural proportions - Golden Section - Anthropometry Visual Scale and Human Scale	08
Unit -III	Principles of Design <ul style="list-style-type: none"> - Introduction to Principles of Design - Theory on Lateral Thinking and exercise on generation of alternatives - Explorations of Principles of Design through 2D and 3D compositions 	09
Unit-IV	Volume , Form & Space <ul style="list-style-type: none"> - Properties of Form - Subtractive & additive forms - Degree of enclosure – Planes - Volumetric Study of Spaces – positive and negative spaces 	08
Unit-V	Organisation: <ul style="list-style-type: none"> - Organisation of Form & Space - Spatial Relationships - Spatial Organisations - Explorations of Organisation through 3D compositions 	08
Unit-VI	Indian Aesthetics: Introduction to all art forms including architecture as a holistic sacred domain with reference from Vishudharmottarpurana. ·Introduction to Art in India as a way of life, as a ritual, as a socio-cultural expression, and more, e.g. Rangoli, Mehendi, Serving of food, ornamentation, arrangement of puja, and so on.	04
Total Contact Hours		45

Learning Resources:

1.	Akiko Busch (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Bacon E.N. (1974) <i>Design of Cities</i> , England, Penguin Books
3.	Barry A Berkus (2000) <i>Architecture, Art – Parallels and Connections</i> , Australia, Watson-Guption Publications
4.	Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i> , New Jersey, John Wiley and Sons
5.	Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i> , New Jersey, John Wiley and Sons
6.	Edward De Bono (1990) <i>Lateral Thinking</i> , London, Penguin Books
7.	Gupta Neerja (2017), <i>A Student's Handbook of Indian Aesthetics</i> , Cambridge Scholars Publishing
8.	Nick Bunn (2010) <i>Architectural Model Making</i> , London, Laurence King Publishing
9.	Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i> , United Kingdom, Acropolis Books
10	ShirishVasantBapat (1993) <i>Basic Design and Anthropometry</i> , Pune, Bela Books
11	Thompson I (1999) <i>Frank Lloyd Wright: A Visual Encyclopedia</i> , London, Grange Book Plc
12	YatinPandya (2014) <i>Elements of Space Making</i> , Ahmedabad, Mapin Publishing

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Elective -I

CourseCode:KHMU18	Course Category: Open elective		Semester: I
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1. To facilitate the students to learn out of a pool of specialised courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making carrier

Course Outcomes:

CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify And describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organization	Document And present the data collected in a systematic way.
5.	Internalizing	Display a technical base through in depth study

Course Contents:

Units	Contents of The Course	Hours
	The detailed course contents will vary as per options selected for elective and expert teaching. The course will frame the contents at the beginning of semester along with objectives, outcomes, references and details for assignments.	
Total Contact Hours		

Learning Resources:

1.	As per topic chosen
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SEMESTER-II

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Architectural Design -II

CourseCode:KHMU21	Course Category: Professional Core		Semester: II
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	2	Sessional Oral (SO)	60 Marks
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To make the students familiar with design and the architectural design process as a synthesis of factors such as climate, comfort, land, technology
2. To equip the students with communication and presentation skills
3. To inculcate sensitivity towards environment through climate responsive design

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Represent built/unbuilt spaces in graphic form
2.	Understanding	Understand the concept of form, space and structure through documentation
3.	Applying	Use isometric, axonometric, and rendering techniques and demonstrate their ideas and observations graphically as well as verbally
4.	Applying	Develop understanding to respond to the climate in order to achieve human comfort
5.	Analysing	Analyse Measured drawing with respect to structure, form, material, climate etc.
6.	Creating	Design multi activity space
7.	Creating	Make 3D views of design proposal

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Documentation Measured drawing of a well-articulated structure with its surrounding context	18
Unit -II	Pre-study: place, climate, scale, people and their activities - Study of place and climate - Site analysis, activity and/or function analysis (Learning from primary and secondary resources such as case-studies and site visits, books, reports, articles, films and documentaries, etc.)	12
Unit -III	Analysis Analysis and presentation of measured drawing with respect to structure, material, planning, context, climate, geography, resources, form, function, elements of design, aesthetics, etc.	18
Unit-IV	Architectural Design - Context based multi-activity architectural design project (approximately up to 300 sq. m.)	30
Unit-V	Time bound project - Single-activity architectural design project: this project shall be based on values in architecture (e.g. universal design, etc.)	12
Total Contact Hours		90

Learning Resources:

1.	Akiko Busch (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i> , New Jersey, John Willy and Sons
3.	Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i> , New Jersey, John Willy and Sons
4.	Krishnan Arvind (2017), <i>Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings</i> , McGraw Hill Education
5.	Neufert Ernst (1970) <i>Neufert Architects data</i> , Bauwelt-Verlag (German 1 st Ed.), Lockwood (English 1 st Ed.)
6.	Nick Bunn (2010) <i>Architectural Model Making</i> , London, Laurence King Publishing
7.	Pandya Yatin (2014) <i>Elements of Space Making</i> , Ahmedabad, Mapin Publishing
8.	Pramar V. S. (1973) <i>Design Fundamentals in Architecture</i> , Somaiya Publication
9.	Rapoport Amos (1969), <i>House, form and culture</i> , Pearson
10.	Thakkar Jay, Morrison Skye, (2008) <i>Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh</i> , SID research Cell, CEPT University

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Building Construction and Materials -II

CourseCode:KHMU22	Course Category: BSAE		Semester: II
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	60 Marks
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To enable students to understand materials, principles and methods of construction
2. To introduce timber construction and its elements in detail.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Know timber as materials in depth and its elements in building construction.
2.	Remembering	Define terms of different timber elements
3.	Understanding	Describe different flooring and roofing materials and understand the concept of spanning for roof element
4.	Applying	Apply appropriate type of timber elements such as door windows, staircase, floor, and roof in design considering form.
5.	Analyzing	Classify different timber elements used in construction and compare different types of materials for roofing, flooring etc
6.	Evaluating	Evaluate suitable joinery for openings
7.	Creating	Summarise knowledge gained in this subject to the architecture design and create drawings and models

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction <ul style="list-style-type: none"> · Introduction to timber construction · Properties, strength, defects and preservation of timber. · Various timber joints: widening joints, halved joints, cogged joints, bearing joints, oblique joints, etc. 	7
Unit -II	Materials <ul style="list-style-type: none"> · Mud blocks, rammed earth blocks · Roofing materials - types, purpose, characteristics, advantages and disadvantages · Flooring and paving - different flooring and paving materials 	7
Unit -III	Timber doors and windows <ul style="list-style-type: none"> · Terminology and construction aspects of doors and windows · Timber doors & Partitions - Design consideration and construction for single and double shutters, partly glazed and partly panelled, fully glazed, fully panelled, flush doors, ledged, braced and battened doors. · Timber windows -Design considerations, principles and construction for sash types-panelled, fixed, partly glazed, fully glazed and louvered. · Timber windows -Types of opening- centrally pivoted, top hung, side hung, casement, bay window and sliding. · Hardwares used for doors and windows 	28
Unit-IV	Timber roofs and trusses <ul style="list-style-type: none"> · Timber roofs - Types of roof construction with respect to slope, span and spanning members · Terminology of sloping roof and members · Need and types of sloping roofs : lean to roof, couple roof, close couple roof and collar roof. · Timber trusses – Principles and considerations of trusses. Forces in truss members. Construction of trusses such as king post, queen post truss, ,mansard roof and trusses for various spans 	28
Unit-V	Timber floors <ul style="list-style-type: none"> · Timber flooring - General idea of timber floors in relation to spans, load transmission ·Types :Single joist, double joist, triple joist 	15
Unit-VI	Staircase <ul style="list-style-type: none"> · Design Consideration and components ·Types of staircases ·Timber staircase 	5
Total Contact Hours		90

Learning Resources:

1.	Rangwala S.C.(2007) Engineering Materials, Gujarat, Charator Publication House
2.	Duggal S.K.(2009) Building materials, New Delhi, New Age International
3.	Don A. Watson,(1972) Construction Materials and Processes, New York, McGraw Hill
4.	W.B. McKay (1981)Building Construction Vol. I,II, UK, Longmans Green and Co.
5.	Barry(1958)The construction of buildings, Vol.I,II, Blackwell science
6.	Roy Chudley, Roger Greeno (1988), Buildings Construction handbook, Routledge

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Theory of Structures -II

CourseCode:KHMU23	Course Category: BSAE		Semester II
Credits :	2	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	1	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	6 Hours

Course Objectives:

1. To understand the structural concepts and behaviour of structural element
2. To introduces forces acting on members in structures

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Recognize the significance of shear force and Bending moment diagram in structural analysis
2.	Understanding	Categorise the forces acting on members in structural analysis
3.	Applying	Develop an understanding of stresses and strain on members
4.	Analysing	Analyse the behaviour and response of structural system to various loading consideration
5.	Evaluating	Justify the dimensions assigned to structural elements of structure for serviceability and safety criteria
6.	Creating	Calculate the load for various load combinations and nature of load (Dead load, Live load)

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to Shear Force Diagram (SFD) and Bending Moment Diagram (BMD) for Simply supported, cantilever, and overhang. Definition of Shear Force (SF), Bending Moment (BM), Sign convention, sagging, hogging, Point of contra flexure, contra shear, effect of couple on beams	04
Unit -II	Details of Shear Force Diagram (SFD) and Bending Moment Diagram (BMD). Details for simply supported, cantilever, overhang beam for a combination of uniformly distributed load (UDL) and point load.	06
Unit -III	Theory of Simple Bending: - Theory of simple bending and bending stress. Details based on the standard section with bending stress distribution diagrams.	06
Unit-IV	Shear Stress of Beam: - Shear stress. Details based on the standard section with shear stress distribution diagram. Introduction to shear centre.	06
Unit-V	Slope And Deflection: - slope and deflection in beams based on standard cases (no derivations).	04
Unit-VI	Arches: - Introduction to arches as structural element, two hinged, three hinged and fixed.	04
Total Contact Hours		30

Learning Resources:

1.	S B Junnarkar & Dr. H J Shah,(2012).Mechanics of Structures Vol. I &II.Anand Charotar Publishing
2.	Deo S.S.(2013).Engineering Mechanics.Pune, Nirali Prakashan
3.	Deo S.S.(2013).Strength of Materials. Pune, Nirali Prakashan
4.	Ramamrutham S. Narayan.R.(2014) <i>Theory of Structures (for Engineering Degree ,Diploma)</i> .New Delhi, Dhanpatrai Publications P.Ltd
5.	Timoshenko Stephen.(2002) <i>Strength of materials part I. (elementary theory and problems) IIIrd ed.</i> New Delhi, CBS Publishers..Timoshenko Stephen.(2002) <i>Strength of materials part II (elementary theory and problems) IIIrded.</i> NewDelhi,CBS Publishers.

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History of Architecture -II

CourseCode:KHMU24	Course Category: Professional Core		Semester: II
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To learn from the wisdom of traditional knowledge systems.
2. To imbibe the fundamental knowledge of the built environment
3. To study the history of architecture as a response to climate, culture and socio-political conditions.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Identify issues with reference to cultures, civilizations, and settlements across the world at different periods of time
2.	Remembering	Know technology and its impact on built environment and building form
3.	Understanding	Understand evolution of various styles of art and architecture
4.	Understanding	Differentiate between various styles and elements of development and describe prominent historic buildings
5.	Applying and Analysing	Develop ability to analyse the evolutionary aspects of stage of progress
6.	Evaluating	Compare architectural style across culture of that time with reference to location -geography , Social Systems, Religion ,climate, art etc.
7.	Evaluating	Appraise structures as a developmental process rather than simply as a product and critique building forms, structure
8.	Creating	Design buildings in historic architectural styles

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Evolution of -Hindu Temple Architecture Evolution of architectural style, principles and major influences on development of form, Spatial organisation, structural development and ornamentation style and other architectural elements during.</p> <ul style="list-style-type: none"> - Gupta period (suggestive examples Temple no 17 , Sanchi, Dashavatara Temple Deogarh etc) - Early and later Chalukyan Temple Development at Airhole , Badami Pattadakal. (suggestive examples Ladkhan and Durga temples-Aihole , Cave temple-Badami, Virupaksha and Papanatha temple- Pattadakal, etc)3. - Temple Development by Rashakutas. (Suggestive example Kailash Temple Ellora) - Temple Development by Pallava - Rock cut and Structural Temples (suggestive examples Rathas, Rock cut caves, Shore temple at Mamallapuram Etc) 	9
Unit -II	<p>Introduction to Dravidian style (Development in South India) Evolution of architectural style, principles and major influences on development of form, Spatial organisation, structural development and ornamentation style and other architectural elements during</p> <ul style="list-style-type: none"> - Hoysala Temple Development. (suggestive example Keshava temple at Somnathpur) - Temple development by Cholas. (suggestive example - Brihadeshwara temple, ThanjavoreEtc - Development of gopuram during Pandya Period. - Vijayanagara Period. (suggestive example -Vittalaswami temple, Hampi, column orders etc) - Development of Temple cities during Madura period. (suggestive examples - Meenakshi temple at Madurai, Sri Ranganatha swamy temple at srirangam etc) 	9
Unit -III	<p>Introduction to Nagara style (Development in North India) Evolution of architectural style, principles and major influences on development of form, Spatial organisation, structural development and ornamentation style and other architectural elements in</p> <ul style="list-style-type: none"> - Orissa -(suggestive examples Mukteshwar Temple, Lingaraja temples at Bhubaneswar, Sun temple at Konark) - Khajuraho- (suggestive examples –Kandariya Mahadeo temple, Khajuraho etc) - Western regions of Gujarat -(suggestive example Sun temple, Modhera, etc) - Jain Temple Development in Western India. (suggestive examples Vimal Shah at Mount Abu, Chaumukh Temple at Ranakpur, etc) 	9
Unit-IV	Early Christian and Byzantine Architecture	6

	<p>Introduction to the social systems, aspects of Spatial organisation, structural development, planning principles and ornamentation elements in the Evolution of Church form.</p> <p>Introduction to the special elements like timber trusses, clerestory, pendentives, dome construction, surface treatment, materials of construction etc. (suggestive examples -St. Peters at Rome (earlier one) Hagia Sophia at Constantinople etc)</p>	
Unit-V	<p>Romanesque</p> <p>Introduction to the social systems, aspects of Spatial organisation, structural development, planning principles and ornamentation elements in the Evolution of Church form.</p> <p>Introduction to the special elements like Wall passages, raking arcades, triforium gallery, vaulting systems etc(suggestive examples – St. Michelle Pavia, Campus at Pisa etc)</p>	6
Unit-VI	<p>Gothic Phase</p> <p>Introduction to the Spatial organisation, planning principles and ornamentation elements in the Evolution of Church form.</p> <p>Introduction to the special elements like buttresses with Structural innovations, pointed arches, vaulting systems, window traceries, flying buttresses etc.(suggestive examples -Amines Cathedral, Notre dame cathedral, Salisbury cathedral, West Ministers Abbey, castles etc)</p>	6
Total Contact Hours		45

Learning Resources:

1.	Percy Brown, (1983) Indian Architecture (Hindu And Buddhist). Bombay, Taraporevala and Sons.
2.	Henri Stierlin, (2002) Hindu India. ISBN 3-8228-1767-8. Taschen GmbH.
3.	George Michell, (1995) Architecture of the Islamic World. London, Thames and Hudson Ltd.
4.	Sandra Forty, (2004) Architecture. Rochester, Grange books
5.	Sir Banister Fletcher, (1996) A History of Architecture. Delhi, CBS Publishers.
6.	DhanpatRai Publications (P) Ltd, 16th Reprint

First Year B Arch.

Architectural Drawing and Graphics -II

CourseCode:KHMU25	Course Category: Professional Core		Semester: II
Credits :	5	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	90Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To introduce various techniques of three-dimensional presentation of simple, complex objects and building elements.
2. To enable the students to understand and express Composite three-dimensional built forms through additive and interpenetrated elements using various graphical projection systems through sections
3. To understand scale proportions in buildings and communication through architectural drawings

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Recognize, three-dimensional drawing and its importance in architectural drawing
2.	Understanding	Understand interpenetration of solids and explain concept of isometric, axonometric projections
3.	Applying	Develop understanding of Sciography and apply in plan and elevations of design
4.	Analysing Evaluating	Analyse And relate the graphics content with Architectural Design
5.	Creating	Create 3D views using isometric and axonometric

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Advanced orthographic projections <ul style="list-style-type: none"> - To draw and compose composite solids and its orthographic projection - Drawing Plan/s, Section/s, Elevation/s of building elements by using methods of orthographic projection 	15
Unit -II	Three dimensional drawings-I <ul style="list-style-type: none"> - Drawing of isometric, axonometric and oblique views of solid objects and their compositions 	15
Unit-III	Three dimensional drawings - II <ul style="list-style-type: none"> - Drawing of isometric, axonometric and oblique views of building elements 	10
Unit -IV	Interpenetration of objects <ul style="list-style-type: none"> - Intersection and interpenetration of solid geometric objects and their compositions - Intersection and interpenetration of architectural elements and their compositions 	15
Unit-V	Introduction to Sciography <ul style="list-style-type: none"> - Introduction to Sciography of simple objects - Representation of shade and shadows in plans and elevations 	8
Unit-VI	Architectural drawings. <ul style="list-style-type: none"> - Learning to make architectural drawings of Master Architect's building drawings (referred from books) in terms of plans, elevations and sections. - Architectural representation of trees, hedges, foliage, human figures, cars, etc., - Building Elements: Techniques of representing building elements such as doors, windows, steps, chajja, porch, canopy, etc. 	12
Total Contact Hours		75

Learning Resources:

1.	F. D K. Ching (2009) Architectural Graphics, New Jersey, John and Wiley and Sons.
2.	Manual of Section, David J. Lewis, Marc Tsurumaki, and Paul Lewis.
3.	Architectural Drawing Course: Tools and Techniques for 2D and 3D Representation, by Mo Zell.
4.	N.D.Bhatt (2012) Engineering Drawing, Gujrat, Charotar Publishing House.
5.	Hugh C. Browning (1996) The Principles of Architectural Drafting, New York, Watson-Guption Publications.
6.	Calvin F. Schmid, Stanton E. Schmid, (1954) Handbook on Graphic Presentation, New York, The Ronald Press Company
7.	David Littlefield (2012) Matric Handbook, London and New York, Routledge Taylor and Francis Group.
8.	Sleeper R.(2000)Architectural Graphic Standards, New York, John Wiley and Sons.
9.	Gill R.W.(2011) Rendering with Pen and Ink, London, Thames & Hudson ltd.

First Year B Arch.

Climatology

CourseCode:KHMU26	Course Category: Professional Core		Semester: II
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	2	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To understand climate and its impact on Architectural Design
2. To encourage sensitivity towards environments

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Outline elements of climate, nature of climate and its zone and recognize importance of climate in architecture
2.	Understanding	Understand the climatic influences on built environment and comfort conditions for inhabitants
3.	Applying	Use the surrounding environment as one of the strategic design parameters
4.	Applying	Employ solar charts and sun path and apply fundamentals of climatology in building design
5.	Analysing	Analyse characteristic of climatic zone in India
6.	Evaluating	Justify opening position, its size in building design by considering air movement
7.	Creating	Relate climate, other environmental parameters and built form at individual and settlement level
8.	Creating	Design climate responsive building

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction: <ul style="list-style-type: none"> - Climate, weather, earth- sun relationship - Elements of climate: Temperature, rainfall, humidity, wind, solar radiation etc. - Importance of climate in Architecture - Global, Macro and Microclimate 	6
Unit -II	Human Comfort: <ul style="list-style-type: none"> - Human heat balance and comfort - Thermal comfort and means of thermal comfort - Heat stress, Effective temperature 	6
Unit -III	Comfort conditions: <ul style="list-style-type: none"> - Bioclimatic chart - Subjective variables - Thermal Comfort Indices - Active & Passive means of thermal control - Degree of control. 	9
Unit-IV	Solar charts & Sun-path: <ul style="list-style-type: none"> - Study of Sun-path, Azimuth & Altitude Angle - Structural control: Sun control and shading devices 	9
Unit-V	Ventilation & Air movement: <ul style="list-style-type: none"> - Study of ventilation & its functions in buildings - Air flow through buildings - Position & size of opening 	6
Unit-VI	Study of Climatic zones & Built environment: <ul style="list-style-type: none"> - Study of nature of climate, its physiological objectives and design criteria - Planning Principles of internal and external spaces, surface treatments and openings etc. for various climatic zones 	9
Total Contact Hours		45

Learning Resources:

1.	Koenigsberger, Ingersoll, Mayhew, Szokolay, (1996) Manual of Tropical Housing and Building - Climatic Design, Orient Longman Limited
2.	G. Z. Brown and Mark Dekay, John Wiley and Sons, (2001) Sun, Wind and Light, 2nd Edition, New York
3.	Baruch Givoni, (1976) Man, Climate and Architecture, U.K., Applied science Publishers, 2nd Edition
4.	T. N. Sheshadri, (2001) Climatological and Solar Data for India, Meerat, Sarita Prakashan
5.	A. Krishan, (2001), Climate Responsive Architecture, Tata Mcgraw Hill

First Year B Arch.**Basic Design-II**

CourseCode:KHMU27	Course Category: Professional Core		Semester: II
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To introduce to the design process as a synthesis of a variety of factors, analysed and studied.
2. To enhance creative thinking skill

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Acquire ,creative thinking and theory of Rasa
2.	Understanding	Understand various techniques for improving creativity
3.	Applying	Use the sources of inspiration for creating concepts for design
4.	Analyzing	Select tools for concept Building
5.	Evaluating	Decide inspiration for concept Building
6.	Creating	Synthesis knowledge gained in this subject with Architectural Design

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Techniques for improving Creativity I: <ul style="list-style-type: none"> - Theories by Edward De Bono: Six thinking hats, lateral thinking - Brainstorming, - Random Combinations - Tree of Possibilities 	08
Unit -II	Techniques for improving Creativity II <ul style="list-style-type: none"> - Abstraction - Transformation - Matrix of Ideas 	08

Unit -III	Sources of inspiration for Creativity: - Role of experience - Mimesis - Literature	08
Unit-IV	Inspiration for concept building: - Material - Geometry - History	08
Unit-V	Tools for Concept building: - Nature and geometry - Visual Memory - Association with other arts	08
Unit-VI	Indian Aesthetics: Introduction to theories of Indian aesthetics specifically the 'Rasa' theory by Abhinavgupta, Bharatmuni, Abhinavbharati, etc., with examples from Natyashastra	05
Total Contact Hours		45

Learning Resources:

1.	Akiko Busch (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Bacon E.N. (1974) <i>Design of Cities</i> , England, Penguin Books
3.	Barry A Berkus (2000) <i>Architecture, Art – Parallels and Connections</i> , Australia, Watson-Guptill Publications
4.	Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i> , New Jersey, John Willy and Sons
5.	Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i> , New Jersey, John Willy and Sons
6.	Edward De Bono (1990) <i>Lateral Thinking</i> , London, Penguin Books
7.	Gupta Neerja (2017), <i>A Student's Handbook of Indian Aesthetics</i> , Cambridge Scholars Publishing
8.	Nick Bunn (2010) <i>Architectural Model Making</i> , London, Laurence King Publishing
9.	Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i> , United Kingdom, Acropolis Books
10.	ShirishVasantBapat (1993) <i>Basic Design and Anthropometry</i> , Pune, Bela Books
11.	Thompson I (1999) <i>Frank Lloyd Wright: A Visual Encyclopedia</i> , London, Grange Book Plc

First Year B Arch.

Elective-II

CourseCode:KHMU28	Course Category: Open Elective		Semester: II
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1. To facilitate the students to learn out of a pool of specialised courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and /or skills in a subject they may opt for making carrier

Course Outcomes:

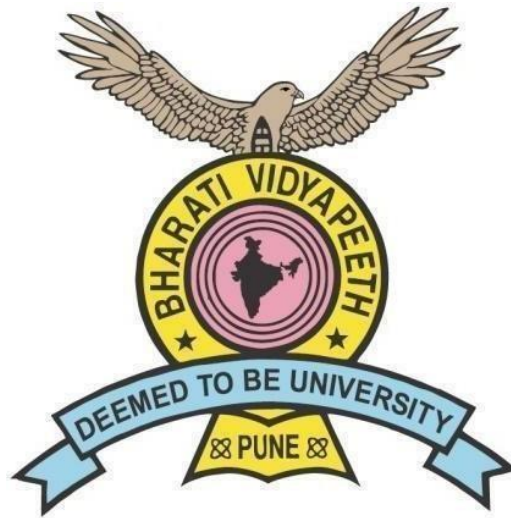
CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organisation	Document And present the data collected in a systematic way.
5.	Internalising	Display a technical base through in depth study

Course Contents:

Units	Contents of The Course	Hours
	The detailed course contents will vary as per options selected for elective and expert teaching. The course will frame the contents at the beginning of semester along with objectives, outcomes, references and details for assignments.	
Total Contact Hours		

Learning Resources:

1.	As per topic chosen
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S.Y.B. ARCH (CBCS 2020)
(Contents Semester III & IV)

For

Bachelor of Architecture (B. Arch) Programme

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune



Prof. Dr. Shivajirao Kadam
Chancellor M.Sc., Ph.D.

Prof. Dr. M. M. Salunkhe
Vice Chancellor M.Sc., Ph.D., F.R.S.C.

Bharati Vidyapeeth (Deemed to be University) Pune, India.

Founder Chancellor : Dr. Patangrao Kadam

★ Accredited with 'A*' Grade (2017) by NAAC ★
★ Category-I University Status by UGC ★
★ NIRF Ranking - 63 ★

"Social Transformation Through Dynamic Education"



Dr. Vishwajeet Kadam
Pro Vice Chancellor B.Tech., M.B.A., Ph.D.

G. Jayakumar
Registrar M.Com., Dip.Pub.Admin.

NOTIFICATION NO. 1107

It is hereby notified for the information of all concerned that the Academic Council, at its 64th meeting held on 29-11-2021 has resolved to approve the revised course structure, rules of examinations and syllabi of the First Year B.Tech (2021 Batch) Second Year B.Tech. (2020 Batch) and Second year B.Arch (2020 Batch) programmes under CBCS for its implementation from the academic year 2021-22 :

Sr. No.	Name of the Programme	First year 2021 batch	Second year 2020 batch
1	Architecture	-	B Arch Second Year
2	Chemical	B Tech First year	B Tech Second year
3	Civil	B Tech First year	B Tech Second year
4	Computer : CE	B Tech First year	B Tech Second year
	Computer : IT	B Tech First year	B Tech Second year
	Computer : CSE	B Tech First year	B Tech Second year
	Computer : CSE (AI&ML)	B Tech First year	
	Computer : CSBS	B Tech First year	B Tech Second year
	Computer : CSBS (18 Batch)	B Tech Final year syllabus	
5	Electrical	B Tech First year	B Tech Second year
6	Electronics : ECE	B Tech First year	B Tech Second year
7	Electronics : ETC	B Tech First year	B Tech Second year
8	Electronics : B Voc : MC	B Voc First year Mobile Computing	
9	Mechanical : Mech	B Tech First year	B Tech Second year
10	Mechanical : RAC	B Tech First year	B Tech Second year
11	Mechanical : B Voc : AS	B Voc First year Automobile Servicing	
12	Mechanical : B Voc : RAC	B Voc First year Refrigeration and Air Conditioning	

This is for the information of all concerned.

Ref. No. BVDU/2021-22/2879

Date: December 7, 2021

To,

1. The Principal, College of Engineering, Pune
2. The Dean, Faculty of Engineering & Technology, College of Engineering, Pune
3. The Controller of Examinations, BVDU, Pune
4. The IT Cell for uploading in the Website.

Notification-AC29-11-2021(64-S.12)

G. Jayakumar
Registrar

SEMESTER III

Second Year B.Arch.

Architectural Design -III

CourseCode:KHMU31	Course Category: Professional Core		Semester: III
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	4	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	-	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To recognise the importance of the site and its surroundings.
2. To understand and apply various grid/modular systems of planning.
3. To understand various determinants which help shape the rural/semi-urban characters.
4. To apply knowledge of various materials (sustainable) traditional/contemporary in their designs.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1	Remembering	Recognize the importance of the site and its surroundings.
2	Understanding	Comprehend the use of various contemporary materials.
3	Applying	Introduce the concept of margins, floor area, etc.in the given context.
4	Analysing	Analyse the aspects related to material, character and grid/modular system of design.
5	Evaluating	Relate knowledge of rural/semi-urban character, material and grid/modular system of design.
6	Creating	Design a multi activity space which demonstrates use of material, character and grid/ modular system of design. Create a final project and 3D model with views.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to concepts of <ul style="list-style-type: none"> – Margins, floor area, etc. for the given site and context of the surroundings. – Various materials – Grid/modular system of design. 	12
Unit -II	Pre-study of multi-activity spaces <ul style="list-style-type: none"> – Precedent study through the lens of location, material, climate and grid/modular system, etc. 	12
Unit -III	Exploration of Various forms and materials <ul style="list-style-type: none"> – Forms can be explored basis geometry, grid, etc. and with use of contemporary material such as RCC, Stone, Timber, etc. 	12
Unit-IV	Analysis: <ul style="list-style-type: none"> – Site analysis, activity and/or function analysis, circulation analysis, programme analysis (activity and occupancy patterns) – Analysis of urban variables and constraints with respect to material, climate, site, resources etc. – Grid/modular based planning, form and rural/semi-urban aesthetics. 	12
Unit-V	Design <ul style="list-style-type: none"> – Context based multi-activity architectural design project demonstrating the appropriate use of studied materials and technology. – Projects such as: Crèche, Pre-Primary School, Police Stations, etc. (Built up area not more than 800 sq. m.) 	30
Unit-VI	Create Spaces for Multi-Function <ul style="list-style-type: none"> – Multi-function architectural design project: This project shall be based on values in architecture. Motels with restaurants, offices and residence, Banks, etc. (Built up area up to 200 sq. m) 	12
Total Contact Hours		90

Learning Resources:

1.	Akiko Busch (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Ching Francis, D. K. (1999), <i>Visual Dictionary of Architecture</i> , New Jersey, John Willy and Sons
3.	Ching Francis, D. K. (2007), <i>Architecture: Form Space & Order</i> , New Jersey, John Willy
4.	Krishnan A., (2017), <i>Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings</i> , McGraw Hill Education
5.	Neufert Ernst (1970), <i>Neufert Architects data, Bauwelt-Verlag (German 1st Ed.)</i> , Lockwood(English 1st Ed.)
6.	Nick Bunn (2010), <i>Architectural Model Making</i> , London, Laurence King Publishing
7.	Pandya Y. (2014), <i>Elements of Space Making</i> , Ahmedabad, Mapin Publishing
8.	Pramar V. S. (1973) <i>Design Fundamentals in Architecture</i> , Somaiya Publication
9.	Rapoport A. (1969), <i>House, form and culture</i> , Pearson
10.	Thakkar J., Morrison S., (2008) <i>Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh</i> , SID research Cell, CEPT University

Second Year B.Arch.

Building Construction and Materials -III

CourseCode:KHMU32	Course Category: BSAE		Semester: III
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To introduce the techniques of cavity walls and retaining walls.
2. To understand the principles of soil behaviour, method of spanning of openings and techniques of shuttering.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Describe various materials as well as its elements in building construction and define technical terms in regards to cavity wall, retaining wall and door –windows.
2.	Understanding	Understand the principles of cavity walls and retaining walls.
3.	Applying	Demonstrate door and windows choosing ‘Aluminium’ as material and apply the knowledge of retaining walls in architecture.
4.	Analysing	Analyse arches and lintels as per span of openings.
5.	Evaluating	Summarise shuttering and guniting.
6.	Creating	Create drawings and models with respect to cavity wall, retaining wall, door and windows.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Materials <ul style="list-style-type: none"> – Fly ash brick, Stabilised earth block, Rammed earth block, Ferro-Crete, Concrete debri block. 	06
Unit -II	Cavity walls <ul style="list-style-type: none"> – Principles and advantages of cavity wall construction – Precautions in cavity wall construction – Cavity walls in brick and composite – Purpose of insulation 	20
Unit -III	Retaining wall <ul style="list-style-type: none"> – Retaining walls and its terminology – Mass retaining wall in bricks, stones etc. – Cantilever retaining wall in R.C.C. 	20
Unit -IV	Aluminium doors and windows <ul style="list-style-type: none"> – Design considerations – Principles and constructional aspects – Advantages and disadvantages – Sliding and sliding folding doors in aluminium – Sliding windows in aluminium 	20
Unit-V	Spanning of Openings <ul style="list-style-type: none"> – Arches -Terminology, load transfer, construction, centering, spanning of openings by arches like flat, segmental, semi-circular, corbel, etc. using stone, bricketc. – Lintels - Construction, form work, spanning of openings by lintels using brick, stone, timber, built up sections, etc. 	18
Unit-VI	Shuttering <ul style="list-style-type: none"> – Need and process – Types of shuttering – Materials used for shuttering – Advantages and disadvantage Guniting <ul style="list-style-type: none"> – Need and Process – Materials used for Guniting – Advantages and disadvantages 	6
Total Contact Hours		90

Learning Resources:

1.	Barry R.(1958), <i>The Construction of Buildings</i> , Volume 1,4,Affiliated East West Press Private Limited, New Delhi
2.	Roy C.(1973), <i>Construction Technology</i> , Volume 1,2,4, Longman Group,Ltd.England.
3.	Mckay J.(1970), <i>Building Construction</i> ,Volume1,2 and 4, Dorling Kindersley(India) Pvt.Ltd.
4.	Sushil Kumar(1965), <i>Building Construction</i> , Standard Publishers Distributors, Delhi.
5.	Rangwala S.C.(1966), <i>Building Construction</i> , Charotar Publishing House Pvt.Ltd., Gujarat India.

Second Year B.Arch.

Theory of Structures-III

CourseCode:KHMU33	Course Category: BSAE		Semester: III
Credits :	2	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	-	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1.To introduce indeterminate structure such as continuous beam, fixed beam, propped cantilever beams, etc.
2. To understand the behaviour of different structural elements for loading conditions.

Course Outcomes:

Co No	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the significance of direct and bending stress in structural analysis of load bearing and framed structure in Reinforced Cement Concrete (R.C.C.), Steel and Timber.
2.	Understanding	Explain structural concepts for fixed beam and continuous beam. Describe the various loading conditions acting on the structure. Illustrate the concept of truss or frame of structures and analysis of various methods such as method of joints and section. Behaviour of column under axial & eccentric load.
3.	Applying	Calculate fixed end moments, support reactions, support moments of beams for various loading conditions. Also calculate the forces in the members of the truss. Develop an ability to analyse internal response of structure under the various loading conditions.
4.	Analysing	Compare response of structural system for various materials such as RCC, Steel, Timber and loading conditions
5.	Evaluating	Evaluate the support moments and reactions of load bearing and framed structures.
6.	Creating	Compile the application of various structural tension members subjected to various loading conditions.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Direct and Bending Stress on Column - Introduction of direct and bending stresses for column, eccentricity in one direction, Importance of kernel of section for rectangle and circle (Theory)	4
Unit -II	Fixed Beams - Combination of Uniformly Distributed load and point load. - (No derivation) Shear Force & Bending Moment & Deflection. (Theory and Simple Numericals)	4
Unit -III	Continuous Beam - Three span continuous beam with uniformly distributed load and Point load to find out support moments and draw Shear force and Bending Moment Diagram based on simple Clapeyron's theorem. - Comparison of Simply supported beam, Fixed beam and continuous beam.(Theory and Simple Numerical)	6
Unit-IV	Analysis of Truss /Frame by Method of Joint - Assumptions in analysis of truss. Condition of Perfect, redundant and deficient truss. Analysis of perfect frames/truss. by method of joints. (Analytical only) Member forces of simply supported & cantilever truss. (simple problems)	6
Unit-V	Analysis of Truss by Method of Section - Analysis of perfect frames/truss by method of sections. Member forces of simply supported & cantilever truss.(simple numerical)	6
Unit-VI	Analysis of Column - Analysis of columns by Euler's and Rankine's theory. Assumptions and limitations of Euler's theory. Effective length for standard of end conditions of columns. Slenderness ratio and its importance. (Theory and simple numerical)	4
Total Contact Hours		30

Learning Resources:

1.	Ramamrutham S. Narayan.R,(2014). <i>Theory of structures</i> . New Delhi, Dhanpat Rai Publishing Company.
2.	Parikh Janak P,(2012). <i>Understanding Concept of Structural Analysis and Design</i> .Anand,Charotar Publishing
3.	R.S.Khurmi,(2020), <i>Theory of structures</i> , Chand & Company Ltd. New Delhi-110055
4.	Dr. R K Bansal.(2010). <i>Strength of Material</i> .Laxmi Publications.
5.	Dr. H.J. Shah. and S.B.Junnakar,(2016 32 nd edition). <i>Mechanics of Structures</i> . (Vol.I).Charotar Publishing house private limited.

Second Year B.Arch.

History of Architecture -III

CourseCode:KHMU34	Course Category: Professional Core		Semester: III
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching Sessional Work	45 Hours
No.of weeks for Assessment	3	No. of Hours for Assessment	09Hours

Course Objectives:

1. To imbibe technology and its impact on the built environment and building form.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know contemporary technology and its impacts on built environment and building form
2.	Understanding	Understand the development of architecture as a process through a holistic approach of contextual and cultural evolution. Describe prominent historic buildings & typology.
3.	Applying	Differentiate various styles and elements of development .
4.	Analysing	Develop ability to analyse the evolutionary stages.
5.	Evaluating	Compare architectural styles with reference to location - Geography, Social Systems, Religion, Climate, Art etc. Appreciate issues with reference to influence of cultures, civilizations and settlements across the world at different historic times.
6.	Creating	Derive materials, construction techniques & architectural features in design from historic styles.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<ul style="list-style-type: none"> - Introduction to Spatial organisation - structural development and ornamentation of Architecture in Indian subcontinent –Indo Islamic Architecture in India. A brief introduction to the origin and characteristics of Islamic architecture: building types, elements, structural systems, construction techniques. <p>Imperial styles:</p> <ul style="list-style-type: none"> - Development of mosques, development of tombs and their developing architectural elements and features. - (probable examples of architectural and building typology are Qutb complex, Quwat-ul-Islam Mosque, Qutb Minar, Sultan Ghari, Tomb of Iltutmish, Tomb of Balban , Alai Darwaja., Jamaat Khana masjid etc.) 	8
Unit -II	<p>Provincial styles:</p> <ul style="list-style-type: none"> - Introduction to various provincial features of Punjab, Sind, Bengal, Gujrat, Kashmir, Jaunpur, Malwa, Deccan etc. and their influencing factors. - (probable examples are Mosque: Jami – Ahmedabad, Gulbarga, Tomb: Gol Gumbaj, Ibrahim Rauza, Bijapur, Civic work: Dada Hari step well, Adalaj etc.) <p>The Mughal phase:</p> <ul style="list-style-type: none"> - Evolution of Mughal style and the different eras of Mughal rule with their unique characteristics and variety of buildings. - (probable examples are Mosque: Jami at Fatehpur Sikri , Delhi - Tomb: Humayun, Akbar, Itmadud-daulla, Mumtaj Mahal - Fort: Fatehpur Sikri, Red Fort at Agra and Delhi, Regal Buildings: Administrative and Residential buildings like Birbal’s house, Jodhabai’s palace and other important monuments.) 	8
Unit -III	<p>Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Renaissance Phase –</p> <ul style="list-style-type: none"> - Revived column orders, rusticated masonry, grand cornices, and public architecture. - (probable examples of architectural and building typology and features like Piazzas- St Mark, Churches – St. Peters Rome, St Paul’s, Palladian villas, buildings with respect to architects etc.) 	7

Unit-IV	<p>Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Baroque Art, Rococo Art -</p> <p>– (probable examples of architectural and building typology and features like French Baroque: Versailles, English baroque – Sir Christopher Wren; Rococo Art and Architecture, interiors-hotels)</p>	7
Unit-V	<p>Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Neoclassical Art and Architecture</p> <p>– Beginnings of modernity –Origin and development of Neo Classicism Structural , Neoclassical architecture , Neo classicists:</p> <p>– (Probable examples architectural and building typology and features like Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux, Boullée, Durand, Jefferson etc.)</p>	7
Unit-VI	<p>Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Industrial Revolution</p> <p>– Causes, consequence and impact in Architecture – Urbanisation in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types. Growing need for mass housing .Its influences in building, technology and modern building materials Steel, glass, RCC etc.</p> <p>– (Probable examples are architectural and building typology and features like Industrial exhibitions- Chicago School and skyscraper development.)</p>	8
Total Contact Hours		45

Learning Resources:

1.	Michell G., (1995) <i>Architecture of the Islamic World</i> . London, Thames and Hudson Ltd
2.	Forty S.,(2004) <i>Architecture</i> .Rochester, Grange books
3.	Fletcher B., (1996) <i>A History of Architecture</i> . Delhi, CBS Publishers.
4.	Hiraskar, (2009), <i>The Great Ages of World Architecture</i> . New Delhi,

Second Year B.Arch.

Architectural Drawings and Graphics -III

CourseCode:KHMU35	Course Category: Professional Core		Semester: III
Credits :	5	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	4	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	90 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To understand the relation between depth of building elements and shades and shadows.
2. To develop three-dimensional visualisation skills of students through perspective drawing techniques.
3. To develop manual skills for rendering techniques and presentation.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Define and describe anatomy of perspective.
2.	Understanding	Explain different types of perspectives.
3.	Applying	Use various methods of drawing perspectives such as direct projection method, measuring point method, approximation method. Demonstrate Sciography in perspective and architectural drawings such as site plan, plan and elevations.
4.	Analysing	Distinguish shades and shadows and relate Sciography with source of light.
5.	Evaluating	Compare parallel and Angular Perspectives. Select appropriate type and method of manual rendering for presentation.
6.	Creating	Sketch perspectives of Interior and exterior.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to Perspective: <ul style="list-style-type: none"> - Anatomy of perspective: Station point, Eye level, Cone of vision, Picture plane, Horizon line, Ground line, Vanishing points. 	5
Unit -II	Types of perspectives: <ul style="list-style-type: none"> - Parallel perspective (One point perspective) - Angular perspectives (Two point perspective) 	10
Unit -III	Methods of Perspective: <ul style="list-style-type: none"> - Measuring point method - Direct projection method - Approximation method 	15
Unit-IV	Sciography and Sciography in Perspective <ul style="list-style-type: none"> - Sciography of complex geometrical objects and different types of building element. - Representation of Sciography (shades and shadows) for buildings on plans, elevations and 3d views. - Sciography in perspective of simple geometrical objects, complex objects and building elements. 	20
Unit-V	Manual Rendering Techniques: <ul style="list-style-type: none"> - Introduction to architectural manual rendering using three mediums such as pencil shading ,colour pencil and water color 	10
Unit-VI	Perspective Drawings: <ul style="list-style-type: none"> - Perspectives for simple and complex Building elements - Perspectives for simple household furniture items. - Rendered Perspectives for interiors and exterior view of Residences. 	15
Total Contact Hours		75

Learning Resources:

1.	Ching F. D K (2009), <i>Architectural Graphics</i> , New Jersey, John and Wiley and Sons.
2.	Lewis D.J., Tsurumaki M.(2016), <i>Manual of Section</i> , Princeton Architectural press.
3.	Mozell (2008) <i>Architectural Drawing Course: Tools and Techniques for 2D and 3D Representation</i> , Bes publishing.
4.	Bhatt N.D. (2012) <i>Engineering Drawing</i> , Gujrat, Charotar Publishing House.
5.	Browning H.C.(1996), <i>The Principles of Architectural Drafting</i> , New York, Watson-Guptill Publications.
6.	Schmid C.F., Schmid S.E, (1954), <i>Handbook on Graphic Presentation</i> , New York, The Ronald Press Company
7.	Littlefield D.(2012) <i>Matric Handbook</i> , London and New York, Routledge Taylor and Francis Group.
8.	Sleeper R. (2000), <i>Architectural Graphic Standards</i> , New York, John Wiely and Sons.
9.	Gill R.W.(2011) <i>Rendering with Pen and Ink</i> , London, Thames &Hudson ltd.

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Building Services -I

CourseCode:KHMU36	Course Category: Professional Core		Semester: III
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To be aware of the importance, installation and working of essential services in buildings.
2. To impart knowledge about design principles for water supply and sanitation services in built spaces.
3. To familiarise students with a way building services help in generating a cleaner and healthier built environment.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Define and describe various terminologies related to plumbing and drainage systems. Recognize purpose, principles, collection, treatment and disposal of water supply and sanitation.
2.	Understanding	Understand laying and fixing of apparatus involved in plumbing and drainage systems.
3.	Applying	Illustrate equipment of water supply and distribution systems in regards to Detached Building, Multi-storeyed building and at Community level and City level. Illustrate different types of sanitation systems such as conservancy lane and water carriage system, sanitary fittings.
4.	Analysing	Analyse sanitary and water supply fittings with respect to function, types, materials, forms, associated equipment and design consideration. Compare types of drainage system and sanitation system such as dry and wet systems.
5.	Evaluating	Relate building services design aspects of water supply and Sanitation systems with Architectural Design.
6.	Creating	Create House drainage layout, Toilet layout, Illustrate Water supply connections, House connections etc.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Water supply <ul style="list-style-type: none"> – Introduction of Surface sources for water supply schemes (i.e. lakes & streams, Ponds, rivers, storage reservoirs) – Introduction to Water treatment - Purification plants. 	6
Unit -II	Water Distribution <ul style="list-style-type: none"> – Water Distribution pipes, their sizes, materials, jointing, fixing and laying. – Pipe appurtenances: valves, taps, faucets, mixing units for wash hand basins, kitchen sinks, shower units, baths etc. – Water Distribution patterns - City Network – Water distribution equipment's: Water storage tanks (Ground and overhead), Estimation of water consumption, their capacity and location. 	8
Unit -III	House connections <ul style="list-style-type: none"> – Tapping of water mains on street by means of ferrule – Lifting of water from the sump tank to the overhead water storage tank with the use of Pumps – Systems of hot water supply using conventional and non-conventional energy sources. – Direct systems, In-direct systems, components and equipment used for the same. 	8
Unit-IV	Sanitation <ul style="list-style-type: none"> – Introduction to sanitation: Purpose and principles of sanitation. – Introduction of various terminologies used in sanitation: Sullage, Sewage, Sewerage, Garbage, Refuse etc. 	8
Unit-V	Sanitary Drainage Systems <ul style="list-style-type: none"> – Various sanitary fittings and fixtures like washbasins, WC's, bathtubs, sink, urinals, bidets, flushing cistern etc. – Various types of traps and their functions. – Locations and use of appurtenances i.e. I.C, manholes, disconnecting chambers – Types of Sewerage Systems: Dry conservancy method Water carriage systems. – Types of Drainage system : Underground drainage system, above ground drainage system and their types. – Types of sanitary pipes : Soil Pipe, waste pipe, vent pipe, rain water pipe, Anti-siphon pipe – Types of joining, fixing and laying. Pipes and piping network. – Testing of drains – Self-cleansing velocity. 	8

Unit-VI	<p>House Drainage</p> <ul style="list-style-type: none"> - Sewage collection and disposal system for individual house of urban areas. - Sewage disposal system for individual house of rural areas or un-sewered localities (Septic tank, soak pit, cesspools, aqua privy, leeching pits) - Disposal within the Premises. <ul style="list-style-type: none"> - Septic tanks, its function and design. - Bio gas plants and their functioning. - Garbage Disposal. - Introduction to sewage treatment plants. 	7
Total Contact Hours	45	

Learning Resources:

1.	Rangwala, S.C. (1989), <i>Water supply and sanitary engineering</i> , Gujarat, Charotar publishing house.
2.	Stein B.andRenolds J. (2006), <i>Mechanical and Electrical Equipment for Building</i> , New York, John Wiley and Sons.
3.	AFE Wise, JA Swaffied Water,(2002) <i>Sanitary & Waste Services in buildings</i> . V Edition, Los Angeles, Mitchell Publishing, Co. Ltd.
4.	Shah C. (1999), <i>Water supply and sanitary engineering</i> , Delhi,Galgotia publishers.
5.	CIBSE journal http://www.cibsejournal.com/ Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE- (www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)

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Computer Applications in Architecture-I

CourseCode:KHMU37	Course Category:SEC		Semester: III
Credits :	3	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week		Sessional Oral (SO)	-
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To enable students to understand and apply basic skills to enhance and present ideas in a professional manner required in architectural offices
2. To introduce students to various skills necessary in architectural documentation such as to create and present documents, reports, and presentations
3. To introduce raster computer graphics and provide an opportunity to learn, practice, and become familiar with image processing, compositions and illustrations

Course Outcomes:

Co. No.	Psychomotor Levels	On Successful Completion of course the learner will be able to:
1.	Imitation	Attain terminology and tools necessary to use various computer applications
2.	Manipulation	Replicate design presentation and report making using digital tools
3.	Precision	Demonstrate the ability to apply knowledge and skills learned
4.	Articulation	Integrate digital and traditional methods of graphics and written compositions in architecture
5.	Naturalisation	Create persuasive and informative digital and traditional posters, presentations and report

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<ul style="list-style-type: none"> - Introduction to Computers and applications relevant to architectural communication and documentation. - Computer terminology and operating principles, - Introduction to hardware and software. - Use and types of printers, scanner, plotter, etc. 	6

Unit -II	Report Preparation I: <ul style="list-style-type: none"> – Word Processing and desktop publishing using softwares to create professional and academic documentation, – Articles, research papers, project reports etc. – Learning to insert images, illustrations, captions; organising documents with proper headers and footers. – Preparations of templates for regular repetitive functions. 	9
Unit -III	Report Preparation II: <ul style="list-style-type: none"> – Data Processing using spreadsheets for professional and academic documentation – Creating charts, graphs etc. Learning to insert charts and analytical illustrations with captions; organising documents with proper headers and footers. 	6
Unit-IV	Presentation Techniques : <ul style="list-style-type: none"> – Presentation and Image / Photo Editing Use of different software for making presentations / slideshows. – To present data and information by using text, images, diagrams with animations, transitional effects and audio movie input, etc. 	12
Unit-V	Info-graphics, Posters, Presentation boards : <ul style="list-style-type: none"> – Compositions using images, graphics, texts, tables, charts for architectural presentations of various types Photo editing software to manipulate or enhance digital images. – Understanding images and vector graphics, image size and resolution. Basic tools for editing and creating graphics. – Use of different layer styles, non-destructive filters, curves and levels, blending modes, etc. to enhance images. – Taking effective prints and plots. 	12
Unit-VI	Making presentation and report: <ul style="list-style-type: none"> – Learning to formulate academic reports, report contents, providing references – Learning to prepare presentation boards, composition types – Learning to compose a comprehensive architectural portfolio 	12
Total Contact Hours		45

Learning Resources:

1.	Faulkner, A., & Chavez, C. (2017). <i>Adobe Photoshop CC Classroom in a Book</i> (2018 release). Adobe Press.
2.	Anton, K. K., & Cruise, J. (2016). <i>Adobe InDesign CC Classroom in a Book</i> (2017 release). Adobe Press.
3.	Wood, B. (2016). <i>Adobe Illustrator CC Classroom in a Book</i> (2017 release). Adobe Press.
4.	White, A. W. (2011). <i>The elements of graphic design: space, unity, page architecture, and type</i> . Skyhorse Publishing, Inc.
5.	Samara, T. (2007). <i>Design elements: A graphic style manual</i> . Rockport publishers.
6.	Ambrose, G., Harris, P., & Ball, N. (2019). <i>The fundamentals of graphic design</i> . Bloomsbury Publishing.
7.	Leborg, C. (2006). <i>Visual Grammar: A Design Handbook (Visual Design Book for Designers, Book on Visual Communication)</i> . Princeton Architectural Press.

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Elective -III

CourseCode:KHMU38	Course Category: PE		Semester: III
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Note: Following is the list of electives under various streams for semester III to facilitate choice to learners in selecting courses of their own interest. Any one of the following electives of any stream can be chosen by the learner. Course details of Electives chosen are in **Annexure I**

Course Objectives:

1. To facilitate the students to learn out of a pool of specialised courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making a career.

Course Outcomes:

CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organisation	Document and present the data collected in a systematic way.
5.	Internalising	Display a technical base through in depth study

Electives:

Semesters	Design	Technology and Management	Allied (Art, legalities, culture, environment, etc)	
Sem-III	A	Vernacular Architecture	Alternative Building Materials and Technology	Sketching
	B	Theory of Design	Presentation Techniques in Architecture	Horticulture

Learning Resources:	As per topic chosen
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SEMESTER IV

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Architectural Design-IV

CourseCode:KHMU41	Course Category: Professional Core		Semester: IV
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	4	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	-	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching Sessional Work	15	No.s of Hours for Teaching Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To familiarise tribal/rural/semi urban settlement/community for their architectural character.
2. To analyse and document the built elements, open spaces and street character in regards to climate and architectural character
3. To design in the context of the location studied, with emphasis on all the aspects that would influence the design solution.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1	Remembering	Recognize the character of the place.
2	Understanding	Comprehend the influence of various factors in making the architecture of the place.
3	Applying	Application of aspects studied in design solutions.
4	Analysing	Analyse and document the built elements, open spaces and street character in regards to climate and architectural character
5	Evaluating	Relate knowledge of architectural character, material and climate for design insert.
6	Creating	Design a multi activity space final project and 3D model with views.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of: <ul style="list-style-type: none"> – Architectural Character of tribal/rural/semi urban settlement/community. – Study of climate, climate variables and response to climate. 	12
Unit -II	Pre-study based on settlement: place, material, form, people and their activities <ul style="list-style-type: none"> – Study of settlement patterns, site, climate, geography such as landforms, history, road patterns, demographics(population density, occupation, age, gender etc.), resources such as water, electricity, open spaces etc. – Social and economic characteristics of the settlement. 	12
Unit -III	Exploration of: <ul style="list-style-type: none"> – Various tribal/rural/semi urban settlement/community aesthetics. 	12
Unit-IV	Analysis: <ul style="list-style-type: none"> – Site analysis, activity and/or function analysis, climate analysis at site and building level. – Zoning and circulation with respect to climate and architectural character. 	12
Unit-V	Design: <ul style="list-style-type: none"> – Context based multi-activity architectural design integrating the acquired knowledge of the above project. like gram panchayat office, primary health centre, school, temple and dharmshala, etc. (Built up area up to 1200 sq. m.) 	30
Unit-VI	Create Multi activity space of temporary nature: <ul style="list-style-type: none"> – Temporary structures such as a shed for camping, bus stop, yatras and relocation for disaster affected people including mobile toilets, mobile schools, mobile libraries, mobile wedding halls, and/or any other space suggested by Gram Panchayat etc. (Built up area up to 300 sq. m.) 	12
Total Contact Hours		90

Learning Resources:

1.	Busch A. (1991) <i>The Art of Architectural Models</i> , Hong Kong, Design Press
2.	Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i> , New Jersey, John Willy and Sons
3.	Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i> , New Jersey, John Willy
4.	Krishnan Arvind (2017), <i>Climate Responsive Architecture: A Design Handbook for Energy Efficient Buildings</i> , McGraw Hill Education
5.	Neufert Ernst (1970) <i>Neufert Architects data</i> , Bauwelt-Verlag (German 1st Ed.), Lockwood (English 1st Ed.)
6	Nick Bunn (2010) <i>Architectural Model Making</i> , London, Laurence King Publishing
7	Pandya Y. (2014) <i>Elements of Space Making</i> , Ahmedabad, Mapin Publishing
8	Pramar V. S. (1973) <i>Design Fundamentals in Architecture</i> , Somaiya Publication
9	Rapoport A. (1969), <i>House, form and culture</i> , Pearson
10	Thakkar J., Morrison S., (2008) <i>Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh</i> , SID research Cell, CEPT University

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Building Construction and Material -IV

CourseCode:KHMU42	Course Category:BSAE		Semester: IV
Credits :	6	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	4	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	108 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	90 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	18 Hours

Course Objectives:

1. To make students to understand different RCC framed constructions
2. To make students understand the working principles of steel doors and windows

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know RCC as materials in depth and its elements in building construction. Recognize steel and waterproofing material.
2.	Understanding	Understand the structural behaviour of various RCC elements and components
3.	Applying	Apply the knowledge of soil behaviour in design of foundations
4.	Analysing	Analyse the performance of waterproofing and damp proofing materials
5.	Evaluating	Evaluate the performance of various materials and shuttering types in RCC framed buildings
6.	Creating	Design doors and windows as per steel as a building material

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Materials <ul style="list-style-type: none"> - Reinforced brick work - Steel as a construction material - Additives and admixtures in R.C.C. - Paints on masonry and on wooden surfaces - Varnishes 	5
Unit-II	RCC elements <ul style="list-style-type: none"> - R. C. C. Lintels and Chajja projections - R. C. C. Slab – one way, two way, single span, continuous spans, coffered slabs, flat slabs and waffle slabs 	18

	<ul style="list-style-type: none"> – R. C. C. Beams – singly and doubly reinforced, single and continuous spans, cantilever beams R.C.C. columns 	
Unit -III	<p>Soil types and its behaviour under different loading conditions.</p> <ul style="list-style-type: none"> – Significance of bulb of pressure and soil loading conditions for R.C.C. framed construction – Principles of R.C.C. Framed construction and its components, potential and application – R.C.C. footing for columns, isolated footing, combined R.C.C. footing , cantilever R.C.C. footing & eccentric footing – R.C.C. Plinth beam and plinth formation Raft foundation, cellular and edge beam – Pile foundation and its types 	20
Unit-IV	<p>Waterproofing and damp-proofing</p> <ul style="list-style-type: none"> – Need and importance of water proofing – Systems of waterproofing – Various waterproofing materials – Need and importance of Damp proofing – Various damp proofing treatments – Various damp proofing materials including bricks, Shahabad stone, bitumen sheets, plastic sheets and other proprietary materials 	12
Unit-V	<p>R.C.C. components</p> <ul style="list-style-type: none"> – R.C.C., Balconies, Canopies, fins, parapets – Details of junctions of slab and beam, slab-beam- column, primary, secondary beams – R.C.C. staircase 	15
Unit-VI	<p>Steel doors and windows</p> <ul style="list-style-type: none"> – Advantage of steel as a material over timber in door and window construction – Steel doors - construction details, component details for safety or grilled door, collapsible door and rolling shutter – Steel window construction details, component details using Z sections and box sections 	20
Total Contact Hours		90

Learning Resources:

1.	Sushil Kumar (1965), <i>Building Construction</i> , Standard Publishers Distributors, Delhi.
2.	Francis D.K.Ching(2008), <i>Building Construction Illustrated</i> , John Wiley and Sons, Inc., Hoboken, New Jersey.
3.	Rangwala S.C.(1966), <i>Building Construction</i> , Charotar Publishing House Pvt.Ltd., Gujarat India.

Second Year B Arch

Theory of Structures -IV

CourseCode:KHMU43	Course Category: BSAE		Semester: IV
Credits :	2	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	-	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1.To understand basic structural design concepts in Reinforced Cement Concrete (R.C.C)
2.To understand behaviour of R.C.C/P.C.C/Precast as a material for framed structure
3. To understand the fundamental design of structural elements like beam, column, slab for various loading such as Point loads, uniformly distributed loads, uniformly varying loads, Imposed and dead load.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the significance of standard R.C.C. section in structural analysis based on IS456.
2.	Understanding	Explain types of loads in structural concepts, and describe the basic concept of Limit state method for various loading conditions acting on the structure. Illustrate the concept of design of R.C.C. slab, beams and staircase for various loading conditions.
3.	Applying	Calculate dead load, live load; wind load, snow load for various loading conditions for design of slab, beams, and staircase. Develop an ability to analyse internal response of structure
4.	Analysing	Compare the response of the structural system for various materials and the loading conditions.
5.	Evaluating	Evaluate the structural elements viz. slab, beams and staircases in load bearing and framed structures.
6.	Creating	Design the simple slab, beams and staircase

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to Standard Reinforced Cement Concrete (R.C.C.) section as per IS 456 – Concepts of cover to steel bars in R.C.C. members, main steel, distribution steel, stirrups, links, dowel bars, bent up bars, curtailment (based on IS 456) (Theory Only)	4
Unit -II	Limit State Method (LSM) – Types of Design Loads - Different types of design load (Dead load, – Live load, wind load, earthquake load and snow load) on structure. – Basic concept of limit state method (LSM). Explain why LSM is adopted today and other methods of design such as Working stress Method, Ultimate load Theory are obsolete. (Theory on Basic Concepts only)	4
Unit -III	Design of R.C.C. Slabs – Design of one way, two way, cantilever slabs by LSM (Theory and simple numerical)	6
Unit-IV	Design of R.C.C. Beams – Design of singly reinforced beam IS456 simply supported and cantilever (Theory and simple numerical) by LSM	6
Unit-V	Doubly reinforced beam and Flanged Beam – Introduction to - doubly reinforced (Theory) - Flanged beam & significance Theory)	4
Unit-VI	Design of R.C.C. Staircase – Design of dog legged staircase using IS456 and LSM (Theory and simple numericals)	6
Total Contact Hours		30

Learning Resources:

1.	Parikh J. P, (2002). <i>Understanding the concept of structural design and analysis</i> . Anand, Charotar Publishing house
2.	Shah V.L. and. Karve S.R., (2014). <i>R.C.C. Theory and Design</i> . Pune, Structures Publishers
3.	Shah H.J., (2013). <i>Design of Reinforced Concrete Structures</i> . Anand, Charotar Publishing house.
4.	Sinha S.N., (2014). <i>Reinforced Concrete Design</i> . New Delhi, Tata McGraw-Hill Publishing Company limited.
5.	Varghese P.C. (2001). <i>Limit state design of reinforced concrete</i> . New Delhi, Prentice-Hall of India.
6.	IS: 456-2000 code of practice for plain and reinforced concrete, SP:16-Design aids for reinforced concrete

Second Year B. Arch.

History of Architecture -IV

CourseCode:KHMU44	Course Category: Professional Core		Semester: IV
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching Sessional Work	15	No.s of Hours for Teaching Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1.	To analyse the development of a specific building typology of a given period.
2.	To understand the development of architecture as a process through a holistic approach of contextual and cultural evolution.
3.	To Compare and analyse architectural style across culture of 19th and 20th century.
4.	To gain knowledge of technology impact on the building form.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know contemporary technology and its impacts on built environment and building form
2.	Understanding	Understand the development of architecture as a process through a holistic approach of contextual and cultural evolution
3.	Applying	Differentiate between various styles and elements of development and describe prominent historic buildings & typology.
4.	Analysing	Develop ability to analyse the evolutionary aspects of stage of progress Appreciate issues with reference to influence of cultures, civilizations and settlements across the world at different historic times
5.	Evaluating	Compare architectural style across culture of that time with reference to location -geography , Social Systems, Religion ,climate, art etc.
6.	Creating	Derive materials, construction techniques & architectural features in design from historic styles.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<ul style="list-style-type: none"> – Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Arts and Crafts movement in Europe and America- – Art and craft philosophies (probable examples- Morris, Webb works etc.) – Introduction to Development of structural systems, Architectural and ornamental elements and spatial organisation principles of Art Nouveau. – Causes, consequence and impact in Architecture Opposition to industrial arts and production – (probable examples Horta, Van De Velde, Gaudi, Guimard, Mackintosh Hoffman, Olbrich- Wright’s early works etc.) 	8
Unit -II	<p>Colonial Architecture in India -Portuguese and French</p> <ul style="list-style-type: none"> – Introduction to Colonial Architecture under British, Portuguese and French with reference to industrial revolution and emergence of new materials and construction techniques. – The Characteristics and Impact of Portuguese Colonial architecture in India: Features, elements and typological developments. – (probable examples - Goa-Bom Jesus Cathedral Complex-Old Goa, Portuguese forts in India , etc) – The Characteristics and Impact of French Colonial architecture in India: Features, elements and typological developments. – (Probable examples from various building typology at Puducherry, Maheetc, French forts in India.) 	7
Unit -III	<p>British Colonial Architecture in India-</p> <ul style="list-style-type: none"> – The styles and trends of architecture brought by British to India and their evolution. The impact of Indo-Saracenic style on the British Architecture in India. – (probable examples from work of Edwin Lutyens, British forts in India, British Cantonments etc.). 	7
Unit-IV	<p>Introduction to Modern Architecture and international style</p> <ul style="list-style-type: none"> – Various new approaches in architecture, new theories and new philosophies put forth by the Architects. The need and Importance. 	8

	<ul style="list-style-type: none"> – (probable examples Bauhaus- Gropius, Meyer and Mies. Bauhaus School, Chicago School of Architecture and Taliesin School of Architecture – Great masters like Louis Sullivan, Frank Lloyd Wright) 	
Unit-V	<p>Postmodernism-</p> <ul style="list-style-type: none"> – Critiquing Modernism - Brutalism- projects of Smithsons and Aldo Van Eyck – writing of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander – Deconstructivism –Critical regionalism – Innovation and ideas of Archigram – postmodern architects like Peter Cook, Paolo Soleri, Robert Venturi – Contemporary architects: Norman Foster, Richard Rogers, James Sterling, Peter Eisenman, Renzo Piano, Daniel leibskind, Zahahadid, Frank O Gehry, Santiago Calatrava, , Rem koolhaas 	8
Unit-VI	<p>Indian Master architects and their work in the 19th and 20th century</p> <ul style="list-style-type: none"> – Major Works and theories of B.V.Doshi, Raj Rewal, A.P.Kanvinde, LauriBaker, Charles Correa etc. 	7
Total Contact Hours		45

Learning Resources:

1.	Kenneth Frampton, (1994) <i>Modern Architecture:A Critical History</i> . London, Thames & Hudson.
2.	Kenneth Frampton, Richard Ingersoll, (2000) <i>World Architecture-A Critical Mosaic 19002000 Vol 1</i> . New York , China Architecture and Building Press
3	ManfredoTafuri, (1980) <i>Modern Architecture</i> . New York, Harry N. Abrams Inc.
4.	William Jr. Curtis,(1988) B.V.Doshi, <i>An Architecture for India</i> . New York, Rizzoli Publication. James Steele,(1985) Hassan Fathy. London, Academy Editions.
5.	Sandra Forty, (2004) <i>Architecture</i> . Rochester, Grange books
6.	Andreas.Papadakis, (1991) <i>A New Spirit in Architecture</i> . London, Academy Editions

Second Year B.Arch.

Surveying and Levelling

CourseCode:KHMU45	Course Category:BSAE		Semester: IV
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	4	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	90 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To understand surveying and levelling as a technical subject and its relevance to Architecture.
2. To acquaint the student with field work necessary so as to measure and document built and unbuilt spaces
3. To study and analyse the various landforms and topography and the importance of this topic in Architecture.

Course Outcomes:

CO No.	Cognitive levels	On successful completion of course the learner will be able to:
1.	Remembering	Recognize the significance of Principles of surveying with respect to ground profiles.
2.	Understanding	Explain the basic concepts and technical terms of plane and geodetic surveying and describe the various surveying instruments required for land surveying. Illustrate the concept of surveying and levelling.
3.	Applying	Calculate bearing of lines, bearings of closed and open traverse, closing error, Elevation/Levels of various ground features and to admeasure the plot. Ability to understand various land forms and surveying instruments
4.	Analysing	Compare response of various conventional and advanced surveying instruments with respect to ground profiles.
5.	Evaluating	Examine plot sizes for modern structures; road network and the use of advanced surveying instruments
6.	Creating	Plan and measure closed traverse with area statement for selected plot up to 400 sq.m and approach road within the campus.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Introduction to surveying</p> <ul style="list-style-type: none"> – Definition of surveying and levelling, – Importance of surveying, Principle of surveying, classification of surveying, Difference between Plan and Map. Scale and Units. Various sign conventions. 	10
Unit -II	<p>Linear measurement & Instruments</p> <ul style="list-style-type: none"> – Methods for direct measurement and Instruments such as chain, tape, arrows, pegs, ranging rods, plumb bob. – Brief note on ranging. Methods of ranging by such as ranging by eye and ranging by line rangers. – Principle of chain survey. Survey station, location sketch, baseline, tieline & checkline. – Definition of Offsets types of offsets. Instruments for laying offsets i) optical square ii)open cross staff iii)French cross staff. 	15
Unit -III	<p>Levelling and Instruments</p> <ul style="list-style-type: none"> – Definition. Important basic terms used in levelling such as datum surface, mean sea level, benchmark, – Types of benchmark, Reduced Level (RL). – Study, and use of dumpy level and its temporary adjustments. Study and use of levelling staff. – Meaning of the term and abbreviations used in levelling work, i)back sight(BS),ii)Foresight(FS) iii)Intermediate sight(IS) iv)Height of Instrument (HI) v)Change point(CP). – Methods of finding reduced level i)Ht of instrument and ii)Rise and fall method. Simple Numericals. Contour study:-Definition, contour intervals, uses and properties of contour lines, methods of locating contours. – Uses of contour maps. Introduction to Topo sheet. – Understanding land topography and its relevance to Architecture & Topo sheet study. – Computation of contour Area. 	15
Unit-IV	<p>Angular measurement and Instruments:-</p> <ul style="list-style-type: none"> – Open & Closed traverse. – Bearing of line, types of Bearing Whole Circle & Reduced Bearing with simple numericals of conversion. Fore bearing and back bearing, study of Prismatic compass, local attraction & its adjustment. 	15

	<ul style="list-style-type: none"> – Theodolite, Use, classification, components of transit theodolite (20second) & their functions. – Temporary adjustment of transit theodolite/vernier theodolite. – Measurement of horizontal angle and vertical angle by transit theodolite. – Introduction to Plane table surveying (Introduction and demonstration only) 	
Unit-V	Advanced Surveying Instruments:- <ul style="list-style-type: none"> – Auto level, Digital level, Digital Planimeter, Total station, electronic distance meter, Digital theodolite, Laser level. (Introduction and demonstration only) 	10
Unit-VI	Emerging trends in Surveying and Levelling <ul style="list-style-type: none"> – Introduction to Remote sensing, Global Positioning Systems(GPS) & Geographic Information Systems(GIS),Google Maps, Aerial photography(Theory only) 	10
Total Contact Hours		75

Learning Resources:

1.	T. P. Kanetkar and S. V. Kulkarni,(2010 edition). Surveying and levelling: part. I and II :A text book on surveying and levelling "for engineering students and practising engineers."PuneVidyarthiGrihaPrakashan,Pune
2.	Dr. B. C. Punmia, Ashok Kr. Jain, Arun Kr. Jain,(2016 edition) Surveying (Vol. I and Vol II). Laxmi Publications(P)Limited,New Delhi
3.	Dr A. M. Chandra.(2005)Plane Surveying and Higher Surveying, New age international publishers New Delhi.
4.	S.K.Duggal,(2019 5 th edition) Surveying Vol. I & II (2013) Mcgraw Hill Education(India)Private limited,New Delhi
5.	R. Subramanian,(2015 2 nd edition) Surveying & levelling Paperback illustrated. Oxford University Press.
6.	N.N.Basak,(2017,2 nd edition).Surveying and Levelling. McGraw Hill Education,India,Private Ltd.
7.	A.Leick, L.Rapoport, D.Tatarnikov,(2015,4 th edition), GPS Satellite Surveying.John Wiley and sons Inc.
8.	Peter A. Burrough, Rachael A. McDonnell, and Christopher D. Lloyd,(2015 3 rd edition). Principles of Geographical Information Systems. Oxford University Press
9.	SatheeshGopi, R. Sathikumar and N. Madhu,(2017 2 nd edition). Advanced Surveying -Total Station, GIS and Remote Sensing.Pearson Education.
10.	Mimi Das Saikia,(2010 1 st edition). Surveying. Prentice Hall India Learning Private Limited.

Second Year B Arch.

Building Services -II

CourseCode:KHMU46	Course Category:BSAE		Semester: IV
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1.To Study basics of electricity and wiring systems within domestic buildings.
2.To Study fundamentals of lighting and lighting design.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know various types of generation of electrical energy and various electrical installations.
2.	Understanding	Understand the use of Electrical control, safety devices, Electrical fittings and appliances.
3	Applying	Develop the knowledge of various types of lamps and types of illumination schemes for indoor and application.
4	Analysing	Analyse design of Daylight apertures and shading devices to control glare .
5	Evaluating	Relate the knowledge of Electrical Services and lighting with Architectural Design.
6.	Creating	Design detailed electrical layout for residences.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Day lighting -I – Day lighting, sky condition, daylight availability graph, sky condition square. Luminance levels for various sky conditions as a function of solar altitude, daylight factor, daylight factor standards, components of daylight factor, functional objectives of daylight.	6

Unit -II	Day lighting -II <ul style="list-style-type: none"> – Site criteria, building configuration, building orientation. – Daylight apertures, glare control, shading devices- external and internal, measurement of day lighting. 	8
Unit -III	Illumination (Artificial lighting) <ul style="list-style-type: none"> – Lighting fundamentals - Luminous intensity, Luminous flux, Illuminance etc. – Light sources - various types of lamps and their characteristics – Types of luminaires for interior and exterior. – Types of illumination schemes –direct, semi direct, diffused lighting and their design consideration. 	8
Unit-IV	Electrification- I <ul style="list-style-type: none"> – Types of generation of electrical energy – conventional and nonconventional. – Introduction to general distribution of electric power in urban areas, substations for small schemes in industrial units. 	6
Unit-V	Electrification-II <ul style="list-style-type: none"> – Electrical installations in a building from the supply company mains to individual outlet points including meter board, distribution board and layout of points. – Electrical wiring systems for small and large installations including different materials involved. 	7
Unit-VI	Electrification-III <ul style="list-style-type: none"> – Electrical control and safety devices – switches, fuse, circuit breakers earthing, lightning conductors etc. – Electrical fittings and appliances. – Detailed electrical layout for residences. 	10
Total Contact Hours		45

Learning Resources:

1.	Benjamin Stein and John Renolds.(2006) <i>Mechanical and Electrical Equipment for Building</i> , New York, John Wiley and Sons.
2.	E.P. Ambrose,(1968) <i>Electric Heating</i> . New York, John Wiley & Sons Inc.
3.	Philips,(1964) <i>Lighting in Architectural Design</i> . New York, McGraw Hill.
4.	R. G. Hopkenson& J. D. Kay, (1969) <i>The lighting of Buildings</i> , London, Faber& Faber.
5.	National Building Code of India, 2005 (NBC 2005)

Second Year B.Arch.

Computer Applications in Architecture-II

CourseCode:KHMU47	Course Category:SEC		Semester: IV
Credits :	3	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	2	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To understand and apply: Basic CAD skills to create simple and complex two dimensional geometric forms, to produce architectural plans, sections, and elevations
2. To be able to create technically correct and presentable drawings

Course Outcomes:

Co. No.	Psychomotor Levels	On Successful Completion of course the learner will be able to:
1.	Imitation	Grasp 2D CAD drafting to transform sketches and manually drafted drawings to 2-dimensional CAD drawings
2.	Manipulation	Demonstrate drafting skills to generate appropriate layouts for various architectural documentation purposes
3.	Precision	Visualise building / transform sketches and 2-dimensional CAD drawings to 3-dimensional building models - create basic 3D models using SketchUp
4.	Articulation	Create 3D models using tools such as SketchUp
5.	Naturalisation	Prepare plots and drawing documentation with the help of computer software

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to 2d Drafting – <ul style="list-style-type: none"> – Introduction to computer aided 2-D drafting. – Basics - Work environment, toolbar, commands and shortcuts etc. – Setting up workspace, drawing organisation, viewing and inquiry commands, layers etc. 	6
Unit -II	2D Drafting Tools - Basics <ul style="list-style-type: none"> – Creating basic objects such as lines, curves, squares, circles, triangles, using various commands and their sub tools including draw, edit, modify, etc. and using precision tools 	6

	<p>units, snaps, tracking etc. Assigning properties and using layers.</p> <ul style="list-style-type: none"> - Learning to use Modification tools, to manipulate and alter objects, move, copy, mirror, patterns, resizing, trimming, extending, etc 	
Unit -III	<p>2D Drafting Tools</p> <ul style="list-style-type: none"> - Reusable and Additional objects - Working with polylines, splines, tables; - Using blocks, palettes; Annotating, Dimensioning, Hatching, Incorporating human figures, vegetation, vehicles, sciography, legend etc. - Attributes and extraction. 	12
Unit-IV	<p>Preparation of drawing</p> <ul style="list-style-type: none"> - compositions, layouts, documentation - CTB/Printing - using page setup, viewports, etc. formatting to ensure annotations, line-weights, dimensioning reflects necessary scale. - Creating templates, taking test print and preparing final plots of well-composed layouts to various standardised scales used in architectural practice. 	9
Unit-V	<p>3D modeling-</p> <ul style="list-style-type: none"> - Introduction to 3D modelling - interface and workspace setup, units, location, snaps, etc. - Using various commands and their sub tools including draw, edit, modify, etc. - Creating, editing and applying materials. Using layers, importing from and exporting to other platforms. - Ability to convert 2D drawing into 3D models. 	12
Unit-VI	<p>3D Drafting of building and site:</p> <ul style="list-style-type: none"> - Using Warehouse, creating groups, components. - Preparing site, building and interior layouts, using scenes and styles, providing scale, Dimensions, Updating model reference. Introduction to 3D rendering with basic renders, materials, textures, using camera tools, basic lighting, shadows. - Introduction to analysis using 3D on both site and building level, eg. site analysis, climate analysis, circulation 	9
Total Contact Hours		45

Learning Resources:

1.	Faulkner, A., & Chavez, C. (2017). <i>Adobe Photoshop CC Classroom in a Book</i> (2018 release). Adobe Press.
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Second Year B Arch.

Elective -IV

CourseCode:KHMU48	Course Category: PE		Semester: IV
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Note: Following is the list of electives under various streams for semester III to facilitate choice to learners in selecting courses of their own interest. Any one of the following electives of any stream can be chosen by the learner. Course details of Electives chosen are in **Annexure II**

Course Objectives:

1. To facilitate the students to learn out of a pool of specialised courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making a career.

Course Outcomes:

CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organisation	Document and present the data collected in a systematic way.
5.	Internalising	Display a technical base through in depth study

Electives:

Semesters		Design	Technology and Management	Allied (Art, legalities, culture, environment, etc)
Sem IV	A	Climate Responsive Building Design	Glass Uses and Application	Visual Communication
	B	Graphic Design	Sustainable Water Management	Introduction to Indology

Learning Resources:	As per topic chosen
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ANNEXURE 1

Elective III

1. Design A_ Vernacular Architecture

Course Contents:

Units	Contents of The Course
1	Defining Vernacular architecture : <ul style="list-style-type: none"> – Definitions and theories. – Contextual responsiveness: Climatic, Geographical, Anthropological and Cultural influences
2	<ul style="list-style-type: none"> – Relation between regional vernacular style with culture, tradition, society, climate and shelter.
3	<ul style="list-style-type: none"> – Study of influence of vernacular style on the house form. – Vernacular architecture around the globe.
4	Study of vernacular building materials and techniques <ul style="list-style-type: none"> – Typical building materials, built form & elements, construction techniques & environmental performance.
5	<ul style="list-style-type: none"> – Study of settlement pattern, dwelling typology, symbolism, typical features, construction materials and techniques.

2. Design B_ Theory of Design

3. Course Contents:

Units	Contents of The Course
1	Intangible channels to architectural creativity <p>The process of creativity :</p> <ul style="list-style-type: none"> – Defining creativity – Creativity in architecture <p>The Channel of Transformations.</p> <ul style="list-style-type: none"> – The theory of transformation – An Attitude for transformation <p>The Exotic and Multicultural</p> <ul style="list-style-type: none"> – The multicultural environment – Gains from the multicultural experience – the need for rigorous involvement with exotic projects
2	Tangible channels to architectural creativity <ul style="list-style-type: none"> – History, Historicism, and the Study of Precedents. – Appreciation of Architectural history – The recent emphasis on precedents – History vs Historicism
3	Mimesis and Literal Interpretation. <ul style="list-style-type: none"> – Attitudes towards mimesis – Inclusivity, imitations and associated concepts
4	Geometry and Creativity. <ul style="list-style-type: none"> – The appeal of geometry

	<ul style="list-style-type: none"> – Geometric forms – Complex buildings and Geometric fields
5	Focus on Materials. <ul style="list-style-type: none"> – Mortality of construction – Structural and esthetic dimensions in the use of materials – Attitudes of architects towards materials – The educational environment and the use of materials
6	The Role of Nature in Architectural Creativity. <ul style="list-style-type: none"> – The primordial influence of nature – Disciplining the intangible into the naturally tangible. – Architectural influences from nature.

4. Technology and Management A _Alternative Building Materials and Technology

Course Contents:

Units	Contents of The Course
1.	<ul style="list-style-type: none"> – Introduction to various alternative natural & manmade building Materials like ‘Mud’, ‘Bamboo’, ‘Fly Ash’, ‘Straw’, ‘Paper’, ‘Glass’, ‘Pet bottles’, ‘Recycled material’, ‘Cloth’ Etc.
2.	<ul style="list-style-type: none"> – Properties of Materials
3.	<ul style="list-style-type: none"> – Documentation of selected materials and its use in practice & alternative construction Technique.
4.	<ul style="list-style-type: none"> – Analysis of the construction techniques of materials.
5.	<ul style="list-style-type: none"> – Inference from the study of use of chosen material & technology
6.	<ul style="list-style-type: none"> – 3d Model/ hands of workshop /design using the material /documentation of alternative use of materials & technology

5. Technology and Management B_ Presentation Techniques in Architecture

Course Contents:

Units	Contents of The Course
1.	<ul style="list-style-type: none"> – Introduction to various manual presentation techniques in architecture.
2.	<ul style="list-style-type: none"> – Knowing various mediums of presentation of architectural drawings such as variety of papers and colours (Papers: cartridge, handmade, tracing papers, gateway, texture paper, tinted, cardboard, etc. Colours: Pencil, ink, pens, charcoal, water markers and colours, poster colours, oil paints, glass markers, etc)
3.	<ul style="list-style-type: none"> – Using different mediums to present architectural drawings/portfolio in 2D and 3D.
4.	<ul style="list-style-type: none"> – Using sketching, caricature, cartoon, collage, pop-art, models to present architectural work

6. Allied A_ Sketching

Course Contents:

Units	Contents of The Course
1.	– Introduction to architectural sketching using various grades of graphite pencil or any other medium
2.	– Principles of free hand sketching such as proportions, with primary thrust on sketching of building elements and built environment, landscape & interiors.
3.	– Indoor and outdoor sketching: An immersive experience of live drawing in various contexts to develop a professional level ability to draw existing objects.
4.	– Free-hand perspective drawing of imagined objects.
5.	– Shading of drawn sketches.

7. Allied B _ Horticulture

Course Contents:

Units	Contents of The Course
1.	– Fundamental of horticulture- Definition, branches, importance and scope.
2.	– Classification of horticultural crops - vegetables, fruits, medicinal, flowering and Ornamental.
3.	– Parameters affecting the growth and development of horticultural crops - climate , soil ,geographical location , water source , cultural , economic etc
4.	– Plant Propagation (definition, basic concepts) and Nursery Management
5.	– Organic farming concept -soil preparation, cropping system, manuring ,protection , harvest and storage
6.	– Advance technologies

Annexure 2

Elective IV

1. Design A_ Climate Responsive Building Design

Course contents:

Units	Contents of The Course
1	– An Introduction to Climate Responsive design, Climate responsive built environment and need of climate Responsive Building Design
2	– Integration of climate responsive design for various climatic zones in India. Study of macro, micro and local climatic conditions. Factors affecting the climate variables such as temperature, humidity etc
3	– Design integration and study of building elements for climate responsive Design. Climate responsive design strategies for various types of buildings such as residential, commercial etc
4	– Climate responsive concepts at site scale, layout of building on the site, design in plan and section, building form, orientation, envelope design, day lighting, ventilation and heating/cooling systems.
5	– Examples and analysis of climate responsive design in various climates.

2. Design B_ Graphic Design

Course contents:

Units	Contents of The Course
1	– Introduction to graphic design and its core Principles such as framing, scale, hierarchy, grids.
2	– Introduction to Typography design
3	– Introduction to colour palette and colour terminologies – Explore various textures and mediums.
4	– Study of background, foreground, scan settings etc

3. Technology and Management A_ Glass: Uses and Application

Course contents:

Units	Contents of The Course
1	– Introduction to glass as a material, properties of glass, types of glass.
2	– Relating to different types of glass used in different building typologies such as residential, commercial, educational buildings etc. by presenting examples. For example, These buildings (focus on use of glass) can be historical buildings or modern buildings and can have a timeline
3	– Identifying glass for special purposes in buildings by suitable examples such as large size glass fixed with spider fittings etc. for malls, IT buildings etc. Exterior uses of glass.
4	– Importance and relevance of glass for interior spaces in various applications such as residential, commercial, institutes.
5	– Importance and need of studying glass available in the market in terms of brochures, samples.

4. Technology and Management B _Sustainable Water Management

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">– Introduction to traditional water management methods adopted in historical times in reference specific to the region.– Sustainable water management principles and practices in recent times
2	<ul style="list-style-type: none">– Its importance and relevance in Design
3	<ul style="list-style-type: none">– Wastewater conservation principles - grey water and sewage water, treatment process and reusing in landscape and service areas in a campus
4	<ul style="list-style-type: none">– Importance of Ground water recharge -natural and artificial– Rainwater Harvesting, rainfall pattern its collection and management, design parameters of RWH and working of this system, Importance of drip irrigation
5	<ul style="list-style-type: none">– Layout study for water management system with a relevant case
6	<ul style="list-style-type: none">– Design implementation of water management system for a small campus

5. Allied A - Visual Communication

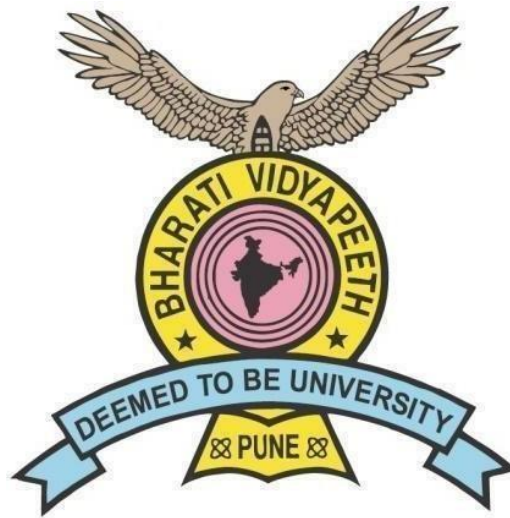
Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">– Introduction to visual communication.
2	<ul style="list-style-type: none">– Need for and importance of visuals in Design.
3	<ul style="list-style-type: none">– Theories of Visual communication.
4	<ul style="list-style-type: none">– Study the Impact of colours, Symbolism, icons, dance, images, associations, culture and Design in visual communication for eg - Colour theory , Psychological implications of Colours, Symbolism, icons, dance, images, associations, culture and Design etc.
5	<ul style="list-style-type: none">– Study of different tools / medium of visual communication.
6	<ul style="list-style-type: none">– Design a small project w.r.t. to visual communication in the age of social media.

6. Allied B Introduction to Indology

Course contents:

Units	Contents of The Course
1	– The Importance and Need to study Indology. Significance of geography on the History of ancient India.
2	– Sources of History. (study of important sources) Types and Significance with relevant examples. Introduction to Archaeology, Indian Epigraphy and Indian Numismatics etc as important sources of History.
3	– Introduction to the various Indian Religious Literature and Epics. Their Contents, Main Teachings.
4	– Introduction and significance Social, political, economic Institutions in Ancient India. Their role.
5	– History of Urbanisation in ancient times. The various dynasties that ruled India and their contribution to the art and architecture of the period.
6	– India and Southeast Asia.



T.Y.B.ARCH CBCS-2020
(Contents Semester V&VI)
For
Bachelor of Architecture (B. Arch) Programme

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune



Prof. Dr. Shivrajrao Kadam
Chancellor
Prof. Dr. Virish A. Seng
Vice Chancellor

Bharati Vidyapeeth
(Deemed to be University)
Pune, India.
Founder Chancellor : Dr. Patangrao Kadam

• Accredited with 12th Grade (2017) by MAAC •
• Category I University Status by UGC •
• AICTE Ranking - 70 •

"Social Transformation Through Dynamic Education"



Dr. Vishwajeet Kadam
Pro Vice Chancellor
G. Jayakumar
Registrar

NOTIFICATION NO. 1171

It is hereby notified for the information of all concerned that the Academic Council, at its 67th meeting held on 1-12-2022 has resolved to approve the revised syllabi, course structure of Third year B.Arch. and Third year B.Tech. programmes of 2020 batch for its implementation from the academic year 2022-23.

This is for the information of all concerned.

Ref. No. BVDU/2022-23/3421
Date: December 9, 2022

To,

- 1 The Principal, College of Engineering, Pune
- 2 The Principal, College of Architecture, Pune
- 3 The Dean, Faculty of Engineering & Technology, Pune
- 4 The Controller of Examinations, BVDU
- 5 The IT Cell for uploading in the Website.


Registrar

SEMESTER V

Third Year B Arch.

Architectural Design - V

CourseCode:KHMU51	Course Category:Professional Core		Semester:V
Credits :	8	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	6	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	144 Hours
No.s of Weeks for Teaching Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	120 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	24 Hours

Course Objectives:

1. To understand and apply campus planning principles
2. To understand and design architectural spaces according to culture.
3. To develop in the students, aptitude of designing in time bound solutions.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the importance of campus planning.
2.	Understanding	Comprehend the use of campus planning principles and sensitise them to specific requirements.
3.	Applying	Apply knowledge gained in given aspects of culture, in the design process.
4.	Analysing	Analyse relationship of multiple buildings in campus with each other in context to establish continuity of form, construction, materials, design theme, climate, etc
5.	Evaluating	Relate knowledge of studied/learnt architectural character, campus planning principle & human habitat as mere expression of multiple aspects and its resultant effect on visual form of the building.
6.	Creating	Designing of progressively complex spaces and buildings in terms of area, a specific community, typology, function etc, with emphasis on either scale or complexity of the project, or both.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of Campus planning fundamentals <ul style="list-style-type: none"> To recognize and understand the fundamentals of the campus planning and its importance in the built environment. 	08
Unit -II	Pre-study based on the Campuses <ul style="list-style-type: none"> To study activities around the buildings within a campus and understand the same in context to built form ,open spaces, elements of landscape, pedestrian and vehicular movement, their segregation, managing sloping sites, contours, etc. 	16
Unit -III	Exploration of : <ul style="list-style-type: none"> Functions, structure and services in a building with relevant structural system and its resultant effect on visual form / character of building 	16
Unit-IV	Analyse: <ul style="list-style-type: none"> Analyse relationship of multiple built forms in campus with each other in context to establish continuity of form, construction, materials, design theme, climate, etc. 	16
Unit-V	Design: <ul style="list-style-type: none"> Campus Design comprising multiple built forms with emphasis on site planning & relationship of built and open spaces, circulation and movement pattern, activity pattern, architectural character.. Designing of buildings with different functions, requiring spaces of different scales and employing suitable structural systems and services. Example: Museum, Institute campus, Community centre, Resort, Community housing, cultural centre, etc. Built-up area consideration: 1500-3000 Sq.m 	40
Unit-VI	Create: <ul style="list-style-type: none"> Designing a multi-activity spaces in given time weightage 25% Examples: Exhibition centre, Library, Convenience shopping, Diagnostic centre, book cafe, etc. Built-up area consideration:300-500 Sq.m 	24
Note:-	Sessional work should consist of two design project (long & short) basis units (5 & 6) in the weightage of 75% and 25%.	
Total Contact Hours		120

Learning Resources:

1.	Correa, C. (2010). A Place in Shade. Delhi: Penguin Books
2.	Kanvinde, A., & Miller, H. (1969). Campus Design in India. Topeka: ostens/American Yearbook Co. .
3.	Lynch, K. (1962). Site Planning. MIT Press.
4.	Pandya, Y., & Foundation, V. S. (2007). Elements of Space Making. Ahmedabad: Mapin Publishing Pvt Ltd.
5.	White, S. (1995). Building in the Garden: Architecture of Joseph Allen Stein in India and California. Delhi:Oxford India Paperbacks.

Third Year B Arch.

Building Construction and Materials -V

CourseCode:KHMU52	Course Category:BSAE		Semester:V
Credits :	5	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	3	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	90 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To enable students to understand the various materials, structures and allied construction activities
2. To introduce steel structure including foundations, advanced steel roofing structure, curtain walling techniques and standardized structure systems

Course Outcomes:

Co. no.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know various properties of structural steel, excavation issues and mass repetitive construction
2.	Understanding	Understand principles of steel structures, building expansion and movement.
3.	Applying	Apply principles studied above in actual construction detail
4.	Analysing	Analyze performance of construction detail in practice
5.	Evaluating	Compare and evaluate the typical construction details of steel structures, joints in buildings, modular construction
6.	Creating	Create drawings with respect to foundations, framed structures, curtain wall and precast systems

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Foundation <ul style="list-style-type: none"> • Foundation for steel structures and fixing of foundation bolts in chemicals. • Introduction to grillage foundations • Fixing of steel stanchions on RCC stub columns 	15
Unit -II	Framed steel structures <ul style="list-style-type: none"> • Study of portal frames, its various types and connection details • Study of castellated beam, veradale girder, portal frames and lattice construction with connection details Introduction to steel decking	18

Unit -III	Curtain wall and cladding <ul style="list-style-type: none">● Curtain Walls- Construction Details of and Structural Glazing Including External Fixing and Cladding details.● Wet cladding systems and dry cladding systems for stone, RC panels, FRP and GRC elements with fixing details	12
Unit-IV	Materials <ul style="list-style-type: none">● Structural steel● Aluminum sections Movements in buildings: <ul style="list-style-type: none">● Expansion/isolation/settlement joints in Load bearing, RCC and Steel structures	10
Unit-V	Construction allied activities <ul style="list-style-type: none">● Timbering and shuttering for trench excavation in various soils● Shoring and underpinning● Flying, raking and dead shoring	9
Unit-VI	Precast Systems and modular coordination <ul style="list-style-type: none">● Introduction to CBRI systems and modular coordination● Precast R.C.C. components (floor, roof,walls) and roof systems, channel unit for floor and roof, prefabricated brick and panel systems● Precast junctions at plinth, floor and roof between columns,beams,walls and lintels.● Introduction to proprietary systems of precast construction.	11
Total Contact Hours		75

Learning Resources:

1.	Barry, R. Building construction vol 2,3,4 (Vols. 2,3,4).
2.	Chudley. Building construction vol 3,4.
3.	Rangwala. Engineering materials. Charator publishing house, Gujrat.
4.	Sushilkumar. Building construction.
5.	T.D Ahuja and G.S. Birdie (1996)Fundamentals of Building Construction New Delhi,DhanpatRai Publishing Company Pvt. Ltd
6	J. S. Foster, Roger Greeno(2007)Mitchell's Structure & Fabric: Part 2.New York,Taylor and Francis group
7	CBRI. Building research note. Retrieved from www.cbri.org

Third Year B Arch.

Theory of Structures -V

CourseCode:KHMU53	Course Category:BSAE		Semester:V
Credits :	2	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	1	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1.To understand basic structural concepts in steel design
2.To understand the behaviour of steel as a structural material
3.To develop the understanding of steel connection and riveted, bolted & welded jointing
4. To apply principles of design in structural drawing for steel structure project

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the significance of standard steel section in Structural analysis based on IS800-2007.
2.	Understanding	Explain types of loads in structural concepts, and describe the basic concept of Limit state method for various loading conditions acting on the structure. Types of shallow foundation relevant to design of footing Illustrate the concept of design of Steel Girder or steel beam as tension member; steel column and R.C.C column as a compression member for various loading conditions.
3.	Applying	Calculate dead load, live load; wind load, snow load for various loading conditions for design of steel girder or steel beam, steel & R.C.C column Develop an ability to analyse internal response of steel Structure as a whole.
4.	Analysing	Compare response of structural system for various Materials and the loading conditions.
5.	Evaluating	Evaluate the structural elements viz steel girder, steel trusses steel stanchions & R.C.C column in load bearing and steel framed structures.
6.	Creating	Design the simple steel girder, steel column and R.C.C column considering material efficiency and cost effectiveness

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Design R.C.C. Column – <ul style="list-style-type: none">• LSM Design of RCC column using IS-456 rectangle/circular (Simple numerical)• Explanation of basic concepts and correlate upper points course outcomes.	4
Unit -II	Design of Footing – <ul style="list-style-type: none">• Types of shallow foundation. LSM Design of footings IS456 rectangular isolated, RCC Pad footing (Design step only)	4
Unit -III	Design of Truss Members – <ul style="list-style-type: none">• Design of tension and compression members of truss using single angle section. (Simple numerical by LSM based on IS 800). Introduction to arrangement of sections. Identification of sections as per compact, semi compact and plastic (Theory only)	6
Unit-IV	Bolted and Welded Connections – <ul style="list-style-type: none">• Connections for steel structures bolted and welded (Theory& Simple numerical).	6
Unit-V	Design of Steel Beam – <ul style="list-style-type: none">• Design of steel beam (LSM IS800) Using single I section. Design of purlins (Simple numerical)	6
Unit-VI	Design of Steel Column – <ul style="list-style-type: none">• Design of steel column (LSM IS800) single section and compound stanchions. Codal provisions for lacing, battening (Design step only)	4
Total Contact Hours		30

Learning Resources:

1.	Fundamentals of Structural Steel Design Paperback – 1 July 2017by Gambhir (Author.McGraw Hill Education. 3rd Edition Limit State Design of Steel Structures
2.	Steel Structures: Design and Practice: Theory and Practice Paperback – 27 August 2010 by N. Subramanian (Author).Limit State Design of Steel Structures 3rd Edition.McGraw-Hill
3.	Design of Reinforced Concrete Structures Paperback – Illustrated, 26 December2013.Third edition.Oxford Publication
4.	R.C.C. Designs Paperback – 1 January 2015 by B.C. Punmia (Author), Ashok Kumar Jain (Author), Arun Kumar Jain (Author) Third edition.Laxmi Publications
5.	Illustrated Reinforced Concrete Design (IS: 456- 2000); Dr. S.R. Karve&Dr. V.L. Shah 5 th edition.Structure Publications.

Third Year B Arch.

Specification Writing

CourseCode:KHMU54	Course Category: Professional Core		Semester:V
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To inculcate the skill of writing specification of materials and items of works.
2. To develop technique of writing specifications for materials and works with emphasis on the required qualities of materials, process of construction and proper sequence of execution for the smooth flawless construction.
3. To encourage use of contemporary & sustainable materials, techniques & technologies and better understanding of specification writing of it.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know the formats and units for specification writing of building materials and items of works in construction.
2.	Understanding	Understand the concept of material specifications with respect to performance, quality and durability,for describing works for effective building contracts and tenders.
3.	Applying	Use of standards specifications as integral part of contract document for various types of building /projects
4.	Analysing	Compare the different materials in the same functional category with respect to use and various building items.
5.	Evaluating	Judge the materials as per their finishes, ratings, sustainable properties along with market valuation and cost.
6.	Creating	Write specifications with reference to building trades, materials, workmanship and performance of different items of works in construction to achieve good quality & durability.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to specifications writing. <ul style="list-style-type: none">● Definition, need and importance of specification, role for architect.● Principles and practices.● The relation between specification, quantities and working drawing.	6
Unit -II	Types of Specifications <ul style="list-style-type: none">● Classification, types of specifications and their applications.● General abbreviations used in specifications.	6
Unit -III	Material Specifications <ul style="list-style-type: none">● Detailed technical specification of common building materials, labour & construction technologies.	12
Unit-IV	Introduction to IS codes. <ul style="list-style-type: none">● Standard Specifications by various Govt. and other Organizations.	6
Unit-V	Items of Works and its Specifications <ul style="list-style-type: none">● Detailed and brief specifications for general works of construction and special items.	12
Unit-VI	Introduction of building services specifications- <ul style="list-style-type: none">● Overview of services such as Water Supply, Drainage, and Electrical and HVAC installations along with brief specifications.	3
Total Contact Hours		45

Learning Resources:

1.	Patil S. (2013) Civil Engineering Contracts and Estimates. Anand. Orient Blackswan, Bangalore
2.	Datta B.N. (2011) Estimation and Quantity Surveying, UBS Publishers & Distributors Ltd. Mumbai.
3.	Willis, C. & A. Willis (1997) Specification writing for architects and surveyors, Blackwell Science, United Kingdom
4.	Bureau of India Standards.
5.	District Schedule Rates

Third Year B Arch.

Landscape Architecture-I

CourseCode:KHMU55	Course Category: Professional Core		Semester:V
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	1	Sessional Oral (SO	60 Marks
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To understand the role and importance of landscape architecture in developing relationships between indoors and out-door spaces.
2.To acknowledge and interpret from history, design principles which respond aptly to the various character man made landscapes with reference to Geography , Economy, Socio-cultural, Religion etc. at different periods of time -.
3. To understand the site and its context while site planning.
4. To create responsible and dedicated individuals who are intellectually mature, emotionally sensitive and self-motivated towards a sustainable built and unbuilt environment.
5.To understand development of landscape architecture as a process of contextual and cultural evolution rather than simply as a product

Course Outcomes:

Co . No .	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the importance of Landscape in sustainable development of spaces.
2.	Understanding	Comprehend the use of landscape planning principles and sensitize them to specific requirements.
3.	Applying	Apply knowledge gained in given aspects of Macro and micro consideration in the design process.
4.	Analysing	Analyse the site potential for the integration of indoor and outdoor spaces with location, climatic, hydrology, geology, vegetation, topography, culture, people, religion etc.
5.	Evaluating	Relate knowledge of studied landscape architecture as a process of contextual and cultural evolution rather than simply as a product.
6.	Creating	Designing -campus landscape spaces which response aptly to the various character man made landscape with reference to Geography, Economy, Sociocultural ,art ,architecture etc.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Introduction to landscape architecture</p> <ul style="list-style-type: none"> ● Importance, need and scope of landscape architecture Man and nature Landscape elements – vegetation, landform, water and architecture. ● Plant element: various aspects of - trees, shrubs, lawns, climbers, hedges, Indoor plants as elements. Basic idea about plants, plant selection, planting design and care of plants. Importance and use of NATIVE vegetation ● Land element: various aspects –soils, topography, levels, grading, earth forms, and foundations. ● Water elements: Fountains, waterfalls, pools, cascades, channels, irrigation etc. ● Architectural elements: sculptures, curbs, walls, steps, fence, furniture et 	6
Unit -II	<p>Historical Landscape development</p> <ul style="list-style-type: none"> ● History and design principles of landscape architecture Eastern , central and western world landscape history and respective design principles with basic background of Geography, Politics, Economy, Social Systems, Religion, Paintings , Sculptures and its influence on landscape Architecture at different periods of time - study the various examples around the world. 	6
Unit -III	<p>Landscape graphics and terminologies</p> <ul style="list-style-type: none"> ● Various terminologies used in landscape architecture with reference to macro ,micro projects ● Graphics – vegetation , shadows , hardscape , various symbols /legend ,etc. 	3
Unit-IV	<p>Landscape site analysis</p> <ul style="list-style-type: none"> ● Landscape project -Macro and micro consideration – manmade and natural location, climatic, hydrology, geology , vegetation , topography culture, people etc. 	9
Unit-V	<p>Site planning -Design-</p> <ul style="list-style-type: none"> ● Landscape project Zoning, concept formulation, design principles, circulation pedestrian &vehicular, and integration of indoor and outdoor spaces. <p>(Landscape project approx. -1500-2000sqm open spaces)</p>	15
Unit-VI	<p>Introduction to Landscape services and construction</p> <ul style="list-style-type: none"> ● Irrigation , lighting , drainage , water features , landform ,pathways road sections , architectural features - gazebo , kiosk , sculptures etc 	6
Total Contact Hours		45

Learning Resources:

1.	Design with nature by Ian McHarg
2.	Landscape Graphics by Grant Reid
3.	The landscape of man by Geoffrey Jellicoe and Susan Jellicoe
4.	Landscape Architecture In India Mohammad Shaheer
5.	Landscape Architecture: History, Ecology and Patterns I P Singh , Minakshi Jain
6	INDIAN SOCIETY OF LANDSCAPE ARCHITECTS Publications
7	Jungle Trees of Central India: A Field Guide for Tree Spotters by PradipKrishen
8	Trees of Delhi: A Field Guide by PradipKrishen
	websites
1	www.flowersofindia.net
2	https://www.cseindia.org/
3	https://indiabiodiversity.org/
4	http://www.indiaenvironmentportal.org.in/

Third Year B Arch.

Building Services-III

CourseCode:KHMU56	Course Category: BSAE		Semester:V
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	1	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To acquaint the students with the fundamentals & principles of acoustics in designing various built environments.
2. To acquaint students with natural & mechanical ventilation systems and their applications.
3. To understand various air- conditioning systems and their applications with sustainable aspects.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize concepts & ideas of Acoustics, air- conditioning systems.
2.	Understanding	Understand Principles of acoustical design for auditorium and ventilation systems.
3.	Applying	Develop an ability to analyse the requirement of sound insulation materials to control noise.
4.	Analysing	Analyse factors affecting indoor air flow.
5.	Evaluating	Compare fans characteristics and its applications with respect to their efficiency.
6.	Creating	Design Ventilation and air conditioning layout considering cost effective aspects.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Sound in enclosed spaces :</p> <ul style="list-style-type: none"> ● Definition of sound, sound frequency range of Audible sound. Characteristics of audible sound. Brief history of architectural Acoustics. Acoustical phenomenon in an enclosed space. Sound reflection, absorption, sound diffusion, sound diffraction, reverberation, room resonance etc. Defects due to reflected sound-formation of echoes, reverberation, sound foci, dead spots etc. ● Airborne and structure borne sound. 	08

Unit -II	Acoustical Design considerations: <ul style="list-style-type: none"> • General principles and factors in acoustical design , Reverberation Time Calculation , Principles of Acoustical design for auditorium - site selection, dimensions, shape, seats and seating arrangement, treatment of interior surfaces, reverberation and sound absorption etc. . 	06
Unit -III	Noise control <ul style="list-style-type: none"> • Recommended background Noise criteria for rooms. Principles of noise reduction. Floor and ceiling construction for noise insulation. Floating floors, outdoor barriers for noise Control, Space layout consideration and Buffer zones, Sound amplifications systems. 	8
Unit-IV	Natural Ventilation <ul style="list-style-type: none"> • Ventilation functions and requirements. Factors affecting indoor air flow -Orientation External features, Position of opening, Size of opening etc. Natural ventilation strategies – cross ventilation , stack ventilation , venturi effect , wind catchers etc. 	8
Unit-V	Mechanical Ventilation <ul style="list-style-type: none"> • Types of Components of Mechanical Ventilation. • Systems of Mechanical Ventilation and its design consideration. 	6
Unit-VI	Principles of air-conditioning systems. <ul style="list-style-type: none"> • Components of air-conditioning systems- such as chilling plants, cooling towers, air handling units etc.Refrigeration cycle and its components. <p>Different types of air conditioning systems.</p> <ul style="list-style-type: none"> • Unit AC’s, split AC’s, packaged AC’s, Central AC’s etc. • Air distribution systems, ducts and ducting layout. <p>Air-conditioning layout design for office building (approximate Area 50-100Sq.m)</p>	9
Total Contact Hours		45

Learning Resources:

1.	1. Benjamin Stein and John Renolds.(2006)Mechanical and Electrical Equipment for Building, New York, John Wiley and Sons.
2.	Leslie, Doelle. Environmental Acoustics. McGraw Hill.1972
3.	National Building Code of India, 2005 (NBC 2005)
4.	Sun, Wind, and Light: Architectural Design Strategies by Mark DeKay (Author), G. Z. Brown .

Third Year B Arch.

Working Drawing-I

CourseCode:KHMU57	Course Category: SEC		Semester:V
Credits :	4	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	60 Marks
Workshops or studio exercises/ week	3	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	72 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	60 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	12 Hours

Course Objectives:

1.Impart skill to students to read and prepare working drawings for load bearing structure and Detailed drawings such as doors, windows, toilets, kitchen, flooring etc.
2.Study of drawing numbering and management

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Define working drawing as architects; medium of communication
2.	Understanding	Understanding role of working drawing in construction field
3.	Applying	Applying working drawing techniques to architectural design drawing
4.	Analysing	Analyzing the details of architectural design from execution viewpoint
5.	Evaluating	Assessing changes needed to enable students to prepare working drawing.
6.	Creating	Making working drawing of given project

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<ul style="list-style-type: none"> Introduction to WD, their significance, study of Example of Working Drawings and its implementation on site 	4
Unit -II	<ul style="list-style-type: none"> Translating architectural design to working drawing 	4
Unit -III	<ul style="list-style-type: none"> Centreline plan, setting out plan of load bearing structure 	12
Unit-IV	<ul style="list-style-type: none"> Plans, elevation and section of load bearing structure 	20
Unit-V	<ul style="list-style-type: none"> Details of components like toilet, kitchen, door and windows etc 	16
Unit-VI	<ul style="list-style-type: none"> Method of drawing numbering and management 	4
	Total Contact Hours	60

Learning Resources:

1.	Wakita, Osamu A., Richard M. Linde, and Nagy R. Bakhoum (2011). "The Professional Practice Of Architectural Working Drawings"
2.	Drawings from ISO certified architect office

Third Year B Arch.

Elective – V

CourseCode:KHMU58	Course Category: PE		Semester:V
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Note: Following is the list of electives under various streams for semester V to facilitate choice to learners in selecting courses of their own interest. Any one of the following electives of any stream can be chosen by the learner. Course details of Electives chosen are in **Annexure 3**.

Course Objectives:

1. To facilitate the students to learn out of a pool of specialized courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making a career.

Course Outcomes:

CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organization	Document and present the data collected in a systematic way.
5.	Internalizing	Display a technical base through in depth study

Electives:

Semesters		Design	Technology and Management	Allied (Art, legalities, culture, environment, etc)
Sem-V	A	Universal Design	Building Automation	Rural development
	B	Light in Architecture	Sustainable Waste Management	Architectural Journalism
	C	Water in Architecture	Cost Effective Construction	Ekistics

Learning Resources:	As per topic chosen
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SEMESTER VI

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Architectural Design -VI

CourseCode:KHMU61	Course Category:Professional Core		Semester:VI
Credits :	8	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	6	Sessional Oral (SO	60 Marks
Workshops or studio exercises / week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	144 Hours
No.s of Weeks for Teaching Sessional Work	15	No.s of Hours for Teaching Sessional Work	120 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	24 Hours

Course Objectives:

1. To develop skill to design service intensive multi - storied building in urban context
2. To explore and demonstrate 'technology and services as major determinants of Architectural form' and understand correlation between function, structure, services and form.
3. To develop in the students, aptitude of designing in time bound solutions.

Course Outcomes:

Co . No .	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the significance of multifunctional built forms in urban context.
2.	Understanding	Understand the building by stacking different functions vertically and addressing various concerns such as coordinating various building services and technology.
3.	Applying	Apply coordination of various building services such as water supply, lifts, drainage, garbage, disposal, lighting, air conditioning etc. in multi-storey buildings.
4.	Analysing	Analyse building as a complex set of arrays, comprising multiple spaces, form, circulation, services and technology.
5.	Evaluating	Evaluate architectural design with various building services and technology
6.	Creating	Design services intensive, multi-storeyed, buildings in urban spatial context.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of: <ul style="list-style-type: none"> Building construction techniques and intensive services involved in similar buildings with an emphasis on development control rules and regulations of local authority. 	08
Unit -II	Prestudy based on the : <ul style="list-style-type: none"> Study of projects built with similar context, need, services, technology, circulations etc. Relationship between built, unbuilt and open spaces. Understand site movements in more 	16

	specific ways like, pedestrian, vehicular, emergency vehicles and their segregation.	
Unit -III	Exploration of : <ul style="list-style-type: none"> ● Design with services and building technology. 	16
Unit-IV	Analyse: <ul style="list-style-type: none"> ● The challenges of functionally complicated building, having a complex set of array of services and activities. 	16
Unit-V	Design focuses on: <ul style="list-style-type: none"> ● Interior environment - closed environment with emphasis on interior spaces, integration of services and regulatory norms. External environment - to take in consideration circulation of emergency vehicles and parking optimization. ● Design of intensive service and technology oriented buildings like: multi-storied office buildings, shopping malls, hotels, hospitals, commercial complex, Industry, Processing unit, etc. ● Built Up considerations :3000-4500 Sq.m 	40
Unit-VI	Create: <ul style="list-style-type: none"> ● Designing of spaces and buildings with emphasis on technology and services ● Projects like: vaccination centre, veterinary clinic, dance School /drama school, sports centre, fuel stations with cafe/takeaways/drive- thru theatres etc (The list of projects building types is only suggestive and not exhaustive). ● Built up considerations : 500-750 Sq.m 	24
Total Contact Hours		120
Note:	Sessional work should consist of two design projects (long & short) basis unit (5 & 6) in the weightage of 75% and 25%.	

Learning Resources:

1.	Gauzin-Muller, D. (2002). Sustainable Architecture and Urbanism: Concepts, Technologies, Examples. 1st Ed. Basel : BirkhäuserVerlag AG
2.	Kloft, E. and Johann, E. (2003). High-rise Manual: Typology and Design, Construction and Technology, 1st Ed. Basel :BirkhauserVerlag AG.
3.	Parker, D. And Wood, A. (2013). The Tall Buildings Reference Book. New York :Routledge.
4.	Chiara, J. D. and Michael, J. C. 2001. Time Savers Standards for Building Types. Singapore : McGraw Hill Professional.
5.	Huxtable, A-L. (1984). Tall Buildings Artistically Reconsidered
6.	Wood, A. and Ruba, S. (2012). Guide to Natural Ventilation in High Rise Office Buildings. New York :Routledge.

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Building Construction and Materials –VI

CourseCode:KHMU62	Course Category:BSAE		Semester:VI
Credits :	5	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	3	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	90 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	75 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	15 Hours

Course Objectives:

1. To acquaint students with long span structures and swimming pools
2. To introduce students to multi-level basements and it's techniques of construction

Course Outcomes:

Co . No .	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know various properties of materials like glass, insulating materials, lightweight concrete blocks, swimming pool definitions,
2.	Understanding	Understand the mechanism of long span structures, working of swimming pool, basement construction, auditorium sightlines
3.	Applying	Show the application of principles to construction long span structures, basements and auditoriums
4.	Analysing	Analyse The case studies of long span structures, swimming pools, high rise structures
5.	Evaluating	Check and summarise the performance of case studies done in course outcome 4
6.	Creating	Design a basement, long span structure and swimming pool

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Long span structures <ul style="list-style-type: none"> ● Pneumatic - Air inflated structures ● Shells ● Space frames ● Folded plates and folded slabs 	15
Unit -II	Materials <ul style="list-style-type: none"> ● Study of Glass and its types ● Insulating materials purpose and types ● Siporex blocks, AAC blocks 	10
Unit -III	Advanced building technologies	12

	<ul style="list-style-type: none">● Pre-stressed and post-tensioning methods pros and cons.● Pre-stressed and post-tensioning slabs and design considerations● Introduction to structural systems for high rise buildings in steel and concrete	
Unit-IV	Swimming pool <ul style="list-style-type: none">● Components of the swimming pool like basin, drain, filter, deck, ladder, diving board, lane and lane marking etc.● Types like private, recreational, sports etc.● Materials used for swimming pool like brick, concrete, fibre reinforced etc.● Techniques used for constructions of swimming pool like underground, above ground, elevated, etc.	15
Unit-V	Multi-Level-basement <ul style="list-style-type: none">● Soil bearing capacity and excavation techniques for basement● Different uses of the basement, it's planning criteria, techniques of construction techniques like retaining wall, diaphragm wall, caissons, cofferdam, etc.	15
Unit-VI	Auditorium <ul style="list-style-type: none">● Auditorium sightlines● Auditorium balcony support systems	8
Total Contact Hours		75

Learning Resources:

1.	Everett, A. (1994). Mitchell's Materials. United Kingdom: Taylor & Francis.
2.	www.iccsiporex.com
3.	Stephen Emmit, C. G. (2006). Barry's Advanced construction of buildings
4.	Time-saver standards for building types. (1990). United Kingdom: McGraw-Hill.
5.	Neufert, P., Neufert, E., Kister, J. (2012). Architects' Data. United Kingdom: Wiley.
	Ching, F. (2001). <i>Building construction illustrated</i> . Van Nostrand Reinhold, 1975.
7	Barry Building Construction Vol 1 to 4

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Theory of Structures -VI

CourseCode:KHMU63	Course Category:BSAE		Semester:VI
Credits :	2	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises / week	1	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1.To understand behaviour of different types of soils and selection of suitable type of foundation and appropriate techniques To understand the behaviour of foundations for complex building structures and large span.
2. To identify Earthquake Zoning and provide Ductile Detailing based on IS 13920.
3 To understand the importance of software for structural analysis, designing and the need for structural modelling.
4. Application of concepts of ductile detailing to understand behaviour of high-rise structures.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize index properties of soil to understand engineering properties of it which is relevant to different types of foundations.
2.	Understanding	Explain –a) suitable types of foundation for various multi-storey buildings in various earthquake zones. b) Significance of retaining structures for various soil conditions. c) Structural serviceability and stability of roof structures for a long span having different materials.
3.	Applying	Calculate the stability check of gravity Develop an ability to analyse internal response of structure
4.	Analysing	Compare response of structural system for various Materials and the loading conditions with respect to Earthquake Zoning.
5.	Evaluating	Evaluate the type of foundation based on Earthquake Zoning and Ductile Detailing based on IS 13920.
6.	Creating	Suitability of type of foundation and design of it with ductile reinforcement.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Mechanics of Soil – <ul style="list-style-type: none"> Type and index properties of soil relevant to foundation for different types of soil. What is Safe bearing capacity of soil, uniform and differential settlement of footing, and liquefaction of soil. Types of pile foundation, group of piles and pile cap. (Theory only) 	4
Unit -II	Earth Pressure – <ul style="list-style-type: none"> Introduction to Rankine's theory of earth pressure 1) Types of retaining walls 2) stability check of gravity & RCC cantilever retaining wall. 3) Drainage in retaining wall importance. What are weep holes (Theory & simple numerical on stability check) 	4
Unit -III	Earthquake Zoning and Ductile Detailing – <ul style="list-style-type: none"> Significance of earthquake zoning and behaviour of wind load relevant to low rise and high rise structure. Base shear, lateral forces based on IS 1893. Introduction to shearwall, structural behaviour, details. Ductile detailing of beam, column and junction based on IS 13920. 	6
Unit-IV	Advance types of Roof Structures - <ul style="list-style-type: none"> Introduction to flat slabs, (beam-less) and its RCC details. Introduction to shell roof/dome/space frame, understanding space frame and space truss. 	6
Unit-V	Long span Structures- <ul style="list-style-type: none"> Introduction to long span structure: plate girder, castellated girder, open web sections, bowstring girders (no numerical). Introduction to pre-stressing of structural elements. Simple numerical based on calculation of extreme fibre stresses for simply supported pre-stressed beam with rectangular section. Behaviour of hinged base and fixed base portal frame (no numerical). 	6
Unit-VI	Emerging Trends in Structures – <ul style="list-style-type: none"> Emerging trends in the modelling and analysis of structure on STAADPRO software 	4
Total Contact Hours		30

Learning Resources:

1.	Soil Mechanics and Foundations (, Dr.Punmia B. C.17 thedition.Laxmi publication
2.	Geotechnical Engineering Paperback – 1 September 2018 by C Venkataramaiah (Author) 6th edition .New Age International Publisher
3.	Theory of Structures SMTS - II: S.I. Units Paperback – 1 January 2017.Laxmi publicationby B.C. Punmia (Author), Ashok Kumar Jain (Author), Arun Kumar Jain (Author)
4.	Reinforced Concrete Vol.II by Dr.H.J.Shah.6th revised & enlarged edition: 2012.Charotar Publishing House Pvt.Ltd.
5.	Building Construction Paperback – 1 January 2016 by B.C. Punmia (Author), Ashok Kumar Jain (Author), Arun Kumar Jain (Author) 11 th edition Laxmi Publications

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Estimation Costing

CourseCode:KHMU64	Course Category: Professional Core		Semester:VI
Credits :	3	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	60 Marks
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	3	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1.To equip students with necessary technical drawings for calculating estimates and detailed costing for small to medium scale building project
2. To understand and apply the concept of quantification of works of construction and procedure to derive estimated cost of construction work items.
3. To acquaint students to analyse the rate of building items, making them conscious of the economy in construction.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know purpose, type and procedure of estimation and costing; Recognize units of measurement of work items; List out various construction work items.
2.	Understanding	Comprehend various methods of Estimation.
3.	Applying	Compute the quantities of items of load bearing construction as well as R.C.C. framed construction, Relate the quantity computation and costing to AD Projects.
4.	Analysing	Analyse rate for items of work to be executed.
5.	Evaluating	Compare market rates, District schedule rates ; Evaluate the rate of load bearing and framed structure
6.	Creating	Generate 'Bill of Quantities' and Produce 'Abstract sheet' for small or medium scale design projects of earlier semesters.

Course Contents:

Units	Contents of The Course	Hours
1	<p>Introduction: Estimation and Costing:</p> <ul style="list-style-type: none"> • Meaning, purpose of estimation and costing. Factors affecting estimation and costing. Data required for preparing an estimate and costing. Understanding Price, Cost and Value Procedure of estimating or method of estimating .Types of Estimates such as Preliminary or approximate and detailed estimate and their types, basic difference and advantage. 	4

2	<p>Mode and units of Measurement:</p> <ul style="list-style-type: none"> ● Introduction to measurement of various construction work items and its Units of measurements, rules of measurement. And mode of measurement as per Indian Standards for various items of work. 	4
3	<p>Quantity Computation:</p> <ul style="list-style-type: none"> ● Calculating quantities from drawing. Detailed Quantity Estimation: Methods of deriving detailed quantities of various constructions work items such as Long Wall and short wall method, centreline method. 	12
4	<p>Rate analysis:</p> <ul style="list-style-type: none"> ● Analysis of rate for different items of work. Factors affecting the rate analysis of an item. Purpose of rate analysis. Rates of Labour and material. Use of PWD/CPWD schedule of Rates .Cost index. Market Rates. Indent of works. 	11
5	<p>Abstract sheet:</p> <ul style="list-style-type: none"> ● Preparation of Abstract of estimated cost. Deriving construction cost with respect to design project.Bill of Quantities (BOQ): Description and significance of items in bill of quantities ,Preparation of Bill of Quantities.Study of tenders. 	11
6	<p>Quantity Computation: Approximate:</p> <ul style="list-style-type: none"> ● Quantity Estimation: Methods of approximate estimate such as Plinth area Method, Cubic content method Service unit method, running metre method. 	3
Total Contact Hours		45

Learning Resources:

1.	Dutta B.N., (2016), Estimation and Costing in Civil Engineering Theory and Practice, UBS Publishers' Distributors Ltd
2.	Patil B. S. (2006), Civil Engineering Contracts and Estimates (Third Edition), Orient Blackswan.
3.	National Building Code(N.B.C.)2005,Bureau of India Standards
4.	Standard Schedule of Rates ,PWD/CPWD
5.	Chakraborti M.(2010),Estimating, Costing, Specification & valuation In Civil Engineering, M. Chakraborti
6	Birdie G.S.(2014),Estimating and Costing (Civil Engineering) 6 th Edition , Dhanpat Rai Books

Third Year B Arch.

Landscape Architecture-II

CourseCode:KHMU65	Course Core	Category: Professional	Semester: VI
Credits :	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	1	Sessional Oral (SO	60 Marks
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	09 Hours

Course Objectives:

1. To understand the complex issues related to landscape architecture for urban context and respond comprehending the natural, man-made and social environment.
2. To understand development of landscape architecture as a process of contextual and cultural evolution rather than simply as a product.
3. To understand the various innovations in the field of landscape architecture.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the complex issues related to landscape architecture at the urban level
2.	Understanding	Understand the development of landscape architecture as a process of contextual and cultural evolution rather than simply as a product.
3.	Applying	Apply the learning for processing /framing the requirements of the specific case.
4.	Analysing	Analysing holistic approach for the macro project
5.	Evaluating	Relate with current need of environmental impact.
6.	Creating	Creating -conceptual landscape proposal for urban spaces.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Landscape site analysis –urban level <ul style="list-style-type: none"> Physical factors such as topography, geology, site features, hydrology, surrounding land-use, buildings and soil conditions - Environmental factors such as climate, existing flora and fauna , Socio-cultural such as existing use, structures of historic or religious importance if any , Aesthetics such as views from and within site 	6
Unit -II	Role of landscape in energy conservation	6

	<ul style="list-style-type: none"> • Role of vegetation -Role of water bodies -Role of land form -Effect on temperature, air movement, noise and pollution 	
Unit -III	The Importance of Urban open spaces <ul style="list-style-type: none"> • To study the importance and effect of and on open spaces in various levels and sizes of settlements / cities , based on the historical, geographical , climate , physical, social, cultural , ecological , economic , environmental aspects etc 	6
Unit-IV	Landscape Typology <ul style="list-style-type: none"> • Study various scales of landscape projects and landscape interventions to understand the approach for design solution such as healing landscape , conservation , sustainability , religious , cultural etc 	9
Unit-V	Landscape Development Approaches <ul style="list-style-type: none"> • Creating Design solution for landscape projects and landscape interventions based on the case studies and site studies . (Project such as campus design , parks ,water front , heritage conservation , pavilion , streetscape , etc.) 	12
Unit-VI	Innovation in landscape technologies and services <ul style="list-style-type: none"> • Alternative techniques for vegetation , slope stabilisation, storm water management , water harvesting ,water body etc. 	6
Total Contact Hours		45

Learning Resources:

1.	Design with nature by Ian McHarg
2.	Landscape Graphics by Grant Reid
3.	The landscape of man by Geoffrey Jellicoe and Susan Jellicoe
4.	Landscape Architecture In India Mohammad Shaheer
5.	Landscape Architecture: History, Ecology and Patterns I P Singh , Minakshi Jain
6.	INDIAN SOCIETY OF LANDSCAPE ARCHITECTS Publications
7.	Jungle Trees of Central India: A Field Guide for Tree Spotters by Pradip Krishen
8.	Trees of Delhi: A Field Guide by Pradip Krishen
9.	Social Life of Small Urban Spaces by William H. Whyte
10.	A History of Garden Art: From the Earliest Times to the Present Day by Marie-Luise Gothein
11.	A Place in the Shade: The New Landscape & Other Essays by Charles Correa
12.	landscape_journal_
13.	Site planning by Kevin A. Lynch
12.	The Image of the City by Kevin A. Lynch
13.	www.flowersofindia.net
14.	https://www.cseindia.org/
15.	https://indiabiodiversity.org/
16.	http://www.indiaenvironmentportal.org.in/
17.	https://worldlandscapearchitect.com
18.	https://climateknowledgeportal.worldbank.org/country/india
19.	https://scholar.google.com/

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Building Services-IV

CourseCode:KHMU66	Course Category: BSAE		Semester:VI
Credits :	2	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	1	Sessionals(SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Course Objectives:

1.To Understand fire safety, fire fighting, fire prevention and installations in buildings including codal requirements
2. To familiarize students with plumbing services in high rise areas, resource optimization.
3. To study various aspects of vertical communication systems.
4. Explore various services including core and building automation systems.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know Fire triangle-Fire rating class of fire and describe Causes and spread of fire in buildings, fire resistance Active control systems of fire.
2.	Understanding	Understand Codes and standards for Firefighting.
3.	Applying	Develop an ability to analyse Water distribution systems in High rise buildings.
4.	Analysing	Relate building design with automation.
5.	Evaluating	Compare Building core arrangement for vertical systems for application in design.
6.	Creating	Design service layout for high rise buildings considering sustainable aspects.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Fire Fighting <ul style="list-style-type: none"> ● Fire triangle-Fire rating class of fire ● Fire detection system ● fire suppression systems ● Causes and spread of fire in buildings, fire resistance ● Active control systems of fire: fixed and portable fire fighting equipment. 	6
Unit -II	Fire fighting in high rise buildings, - <ul style="list-style-type: none"> ● Passive control of fire, Codal provision and standards for Fire fighting. 	4

Unit -III	Water supply systems in High Rise Building <ul style="list-style-type: none">● Water Requirement for High Rise Building● Water distribution systems in High rise buildings- down feed water distribution, pumped up feed distribution, constant pressure up feed, gravity down feed system.● Hot water requirement, generation and supply in high rise buildings.● Rainwater Harvesting for high Rise	4
Unit-IV	Sewerage systems in High rise buildings <ul style="list-style-type: none">● Service floor for high rise buildings e.g. Hospitals, hotels etc.● Introduction to sewage treatment systems and recycling	8
Unit-V	Vertical Transportation Systems in High Rise Buildings <ul style="list-style-type: none">● Building core arrangement for vertical systems, Vertical communication systems for high rise buildings-Types of Elevators, Sky lobby Elevator system, double- deck elevator system, Hydraulic Elevators and Escalators-travelators.	4
Unit-VI	Introduction to Building automation systems. <ul style="list-style-type: none">● Building automation systems for mechanical, electrical and plumbing services.	4
Total Contact Hours		30

Learning Resources:

1.	Benjamin Stein and John Renolds.(2006)Mechanical and Electrical Equipment for Building, New York, John Wiley and Sons.
2.	Fire Safety: National Building Code of India 1983 published by Bureau of Indian Standards.
3.	National Building Code of India, 2005 (NBC 2005)

Third Year B Arch.

Working Drawing-II

CourseCode:KHMU67	Course Category: SEC		Semester:VI
Credits :	4	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	2	Sessional Oral (SO	60 Marks
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	72 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	60 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	12 Hours

Course Objectives:

1. Impart skill to prepare working drawings for RCC Framed structure with details.
2. Study of services such as water supply and drainage.
3. Study of various aspects of Municipal submission drawing.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Know working drawing technique for RCC work
2.	Understanding	Understand DCR
3.	Applying	Apply DCR to given project
4.	Analysing	Analysing requirements of working drawing set
5.	Evaluating	Relate working drawing to other relevant subjects
6.	Creating	Prepare municipal submission and detailed working drawings

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<ul style="list-style-type: none"> Introduction and importance of DCR, Introduction to "submission" drawing as part of procedure to get building permission, 	4
Unit -II	<ul style="list-style-type: none"> Preparation of Municipal submission drawing 	8
Unit -III	<ul style="list-style-type: none"> Study of technique of making working drawing of RCC frame building 	12
Unit-IV	<ul style="list-style-type: none"> All plans, elevations and section of RCC building of approx. 100 sq.m 	16
Unit-V	<ul style="list-style-type: none"> Technical details of staircase, planning of staircase. Risers, treads and handrail details. Finishes. 	8
Unit-VI	<ul style="list-style-type: none"> Services layout such as water supply, drainage, electrical 	12
Total Contact Hours		60

Learning Resources:

1.	1.Wakita, Osamu A., Richard M. Linde, and Nagy R. Bakhoum (2011). "The Professional Practice Of Architectural Working Drawings.
2.	Journals: Gawne, Eleanor. "Cataloguing architectural drawings." Journal of the Society of Archivists 24.2 (2003): 175-187

Third Year B Arch.

Elective – VI

CourseCode:KHMU68	Course Category: PE		Semester:VI
Credits :	2	Internal Assessment	100 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO	-
Workshops or studio exercises/ week	1	Sessionals(SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	36 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	30 Hours
No.of weeks for Assessment	3	No.of Hours for Assessment	06 Hours

Note: Following is the list of electives under various streams for semester VI to facilitate choice to learners in selecting courses of their own interest. Any one of the following electives of any stream can be chosen by the learner. Course details of Electives chosen are in **Annexure 4**.

Course Objectives:

1. To facilitate the students to learn out of a pool of specialized courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making a career.

Course Outcomes:

Co No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents
2.	Responding	Report case study
3.	Valuing	Justify their ideas /opinions in relation to contents of elective
4.	Organization	Document and present the data collected in a systematic way.
5.	Internalizing	Display a technical base through in depth study

Electives:

Semesters		Design	Technology and Management	Allied (Art, legalities, culture, environment, etc)
Sem-VI	A	Furniture Design	Auditorium Acoustics and Services	Affordable Housing
	B	Gendered Spaces	Fenestrations in Buildings	Building Economics
	C	Architects and Their Philosophies	Facility Management	Introduction to Archaeology

Learning Resources:	As per topic chosen
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ANNEXURE 3

Elective V

1. Design A_ Universal Design

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Orientation to Disability, types of impairments, their needs and barriers and role of environment in creating disabilities.
2	<ul style="list-style-type: none">● Study of National and International Legal and policy framework for Universal Access and Disability inclusion.
3	<ul style="list-style-type: none">● Understanding Accessibility, Universal Design and UD Principles along with examples.
4	<ul style="list-style-type: none">● Study of MOUD's Harmonised Guidelines for creating barrier free built environment covering all building typologies.
5	<ul style="list-style-type: none">● Introduction to tools for evaluating accessibility and safety in a built environment.

2. Design B_ Light in Architecture

Units	Contents of The Course
1	<ul style="list-style-type: none">● Understanding the importance of light in Architecture, types of light fixtures based on use, function, location etc.
2	<ul style="list-style-type: none">● Introduction to indoor lighting systems for aesthetics, focus lighting, task lighting, ambient lighting and accent lighting.
3	<ul style="list-style-type: none">● Introduction to outdoor lighting systems for aesthetics, task lighting, functional lighting, Spotlights, Flood Lights, Up/Down lights, Step Lights, Garden Lights, Bollard Lights, String Lights etc.
4	<ul style="list-style-type: none">● Efficient lighting systems with energy conservation features and application in a small residence. Evaluating the energy consumption for different types of lighting with a case study.
5	<ul style="list-style-type: none">● Design of lighting system for Indoor areas/outdoor area depending on the use and function ex: display gallery of museum, mood lighting for a Bar, landscape lighting in a public park, outdoor water fountain, etc.

3. Design C_ Water in Architecture

Course contents:

Units	Contents of The Course
1	Introduction to Water in Architecture <ul style="list-style-type: none">● The impact of water in architectural thinking● Indian water context● Conventional water context
2	Water in Architecture & its Cultural heritage <ul style="list-style-type: none">● Water in outdoor space● Water in Indoor space● Water & in between spaces
3	Water Source & its Reflection on Architecture <ul style="list-style-type: none">● Types of water sources● Use in architecture /landscape as its reflection
4	Introduction to <ul style="list-style-type: none">● Architecture – water – technology relationship● Architecture – water – art relationship

5	Role of Water in Architectural Design <ul style="list-style-type: none"> ● Underwater Architecture ● Waterfront Architecture
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4. Technology and Management A_ Building Automation

Course Contents:

Units	Contents of The Course
1	Introduction to Automation System. <ul style="list-style-type: none"> ● Scope of Automaton ● Benefits to Owner, Builders, Installers & Service Contractors ● Fundamentals of Automation. ● Power line carrier control, Time Controllers, Computer controllers & Wireless Remote Controller
2	Basic Electronics <ul style="list-style-type: none"> ● Introduction to Electronics from vacuum tubes to large scale, classification of electronic signals, digital and analogue, role of A/D and D/A converters, electronic components, symbols and identifications, semi conductivity. ● Diodes and Diode circuits ● Semiconductors and their applications ● Analysis of basic simple circuits using Ohm's law, Kirchoff's laws and network theorems
3	Control Standards Or Protocols/Modules <ul style="list-style-type: none"> ● X-10 standards, CEBus Standards ● Z wave, Zigbee, BLE(Bluetooth Low energy) ● UPB (Universal Powerline Bus) & WI-FI ● Home automation Platforms
4	Smart Home Devices <ul style="list-style-type: none"> ● Software & Hardware for Smart Homes ● HUB ● Sensors ● Actuators
5	Home Automation <ul style="list-style-type: none"> ● Home Entertainment & lighting ● Home Security ● Home Plumbing & HVAC

5. Technology and Management B _ Sustainable Waste Management

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none"> ● Introduction to solid Waste, contents, sources, types and classifications.
2	<ul style="list-style-type: none"> ● Rules and Regulations related to solid waste management.
3	<ul style="list-style-type: none"> ● Sustainable solid waste management, practices at various level- small residential to campus level
4	<ul style="list-style-type: none"> ● Integrated solid waste management (ISWM)
5	<ul style="list-style-type: none"> ● Understanding SWM and ISWM with case study.

6. Technology and Management C: _Cost Effective Construction

Course Contents

Units	Contents of The Course
1	<ul style="list-style-type: none">● -Introduction to Cost Effective Construction concepts.
2	<ul style="list-style-type: none">● -Identification of construction process, Materials, and building components with regards to cost effective approach
3	<ul style="list-style-type: none">● -Environment friendly and cost effective Building Technologies - Different cost effective substitute for various building components as wall, floor, roof etc.
4	<ul style="list-style-type: none">● -Uses of different types of materials and their availability,
5	<ul style="list-style-type: none">● overview of various methods of cost effective construction through practicing of modular, precast, and composite building elements in building construction

7. Allied A - Rural development

Course contents:

Units	Contents of The Course
1	Introduction to rural development: Terminologies, concepts, objectives and elements of rural development such as livelihoods, education, housing, healthcare, employment, women empowerment etc.
2	Factors affecting rural settlement planning: Study a rural settlement based on physical, economic, social cultural, historical and etc. factors with examples of any settlement in Indian context
3	Rural Development Policies and Strategies Types of Rural Development Strategies; Rural Development: Major Initiatives
4	Rural Development Programmes in India - Current Rural Development Programmes like: National Rural Livelihood Mission; Pradhan Mantri, GraminAwaasYojana ; Pradhan Mantri Gram SadakYojana (PMGSY); DAY-NRLM; DDU-GKY ; SanasadAadarsh Gram Yojana (SAGY); etc.
5	Principles, planning and working of MODEL Villages: Resource planning and management, social and economic support, community participation, etc. with the help of studies of MODEL villages in India and Global examples.

8. Allied B - Architectural Journalism

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Structure of architecture Journals and Book reviews
2	<ul style="list-style-type: none">● Writing Descriptive and analytical reports
3	<ul style="list-style-type: none">● Editing write ups, Photo Journalism, Page compositions.
4	<ul style="list-style-type: none">● The public process
5	<ul style="list-style-type: none">● Electronic media

9. Allied C - Ekistics

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● To study the emergence and scope of ekistics and its need in shaping the Human Settlements.
2	<ul style="list-style-type: none">● Settlement patterns in later periods of history; Changing form and pattern of human settlements in ancient, medieval, colonial and modern India.
3	<ul style="list-style-type: none">● Introduction to the study of complex, indigenous, old and new city fabrics w.r.t. demographics, land economics, sociology , environment, legislations, transportation and networks , regional planning and GIS.
4	<ul style="list-style-type: none">● Globalization and its impact on cities – Urbanization, emergence of new forms of developments –self sustained communities – SEZ – transit development – integrated townships (through case studies).
5	<ul style="list-style-type: none">● Emergence of the metropolitan phenomenon; planning problems of cities and Solutions.

ANNEXURE 4

Elective VI

1. Design A_ Furniture Design

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">Aspects of Design for various types of outdoor and indoor furniture and anthropology.
2	<ul style="list-style-type: none">Fundamentals of furniture design like form, structure, colour, geometry, material. And types as Modular furniture, built in furniture, foldable furniture.
3	<ul style="list-style-type: none">Study of Eco Friendly climate responsive materials in furniture manufacturing
4	<ul style="list-style-type: none">Furniture manufacturing technology, methods of joinery, fabrication and assembly
5	<ul style="list-style-type: none">Various fittings and fixtures, furniture accessories, and modern techniques for fitting fixtures and assembly of furniture unit Scope case study of interior space of 200 sq. m. indoor or outdoor space analysing furniture design aspects in relation with material, functionality, and manufacturing analysis

2.Design B_ Gendered Spaces

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">Understanding the definition of Gendered Spaces and determinants that shape gendered spaces.
2	<ul style="list-style-type: none">Development of built spaces w.r.t. gender and space.<ul style="list-style-type: none">Study of Gender differences that are shaped by several determinants other than the biological differences between men and women.such as history, culture, religion and environment
3	<ul style="list-style-type: none">Study of Social, political, and economic forces and values that shape the built environment and its form basis Genders.
4	<ul style="list-style-type: none">Public Spaces: Power and access
5	<ul style="list-style-type: none">Domestic Spaces: Social Roles, hierarchy in space w.r.t privacy needs, work environments, beliefs, customs and rituals, etc.

3.Design C_ Architects and Their Philosophies

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">Introduction to Design Philosophydifferent design philosophies and importance of philosophies in architecture
2	<ul style="list-style-type: none">Principles of Architecture
3	<ul style="list-style-type: none">Famous ten architects and their philosophies from ancient time
4	<ul style="list-style-type: none">Examples based on Architect philosophies
5	<ul style="list-style-type: none">Architects philosophies from contemporary time

4. Technology and Management A _ Auditorium Acoustics and Services

Course contents:

Units	Contents of The Course
1	Introduction to Auditorium Design <ul style="list-style-type: none">● General Principles of Auditorium design● Types of Auditorium design depending on shape, size & volume. Horizontal & vertical cone of vision.● Sight line, Seating arrangement-back to back & staggered seating, Back stage, rehearsal rm, changing rm
2	Acoustical Phenomenon <ul style="list-style-type: none">● Role of acoustic in Auditorium Architecture● Sound Intensity● Reverberation, Attenuation, Echo & Sound shadow● Acoustics Material & Properties
3	Other services for Auditorium design <ul style="list-style-type: none">● Stage lighting, Lighting controls● Column free/long span structure● Balcony supportive mechanism● Motorized curtain system● Fire Safety
4	Introduction to multiplex design. <ul style="list-style-type: none">● Sight line, Seating arrangements, project room, central aisle & side aisle in multiplex design● Design of multiplex depending upon seating capacity, arrangements its shape & size

5. Technology and Management B _ Fenestrations in Buildings (SUB)

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Identifying suitable examples of fenestration designs based on observation of different building typologies residential, commercial, institutional
2	<ul style="list-style-type: none">● Utility and sustainability aspects in fenestration design such as fins/louvers/jail etc. to be studied by students.
3	<ul style="list-style-type: none">● Building technology, installation detailing in cross section and 3d Views about the fenestration
4	<ul style="list-style-type: none">● Study about economy as cost and utility of providing fenestrations and the final finishes or aesthetics of fenestration

6. Technology and Management C _ Facility Management

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Understanding Planning norms, working drawings and built environment for various Services & Utilities, Township facilities; Schools, Hospitals, Housing, Commercial Complexes etc.
2	<ul style="list-style-type: none">● Importance of building services, type of services required to keep the facility usable.
3	<ul style="list-style-type: none">● Planning of services, organization structures of services management.
4	<ul style="list-style-type: none">● Role and administrative functions of Supervisors. Role and responsibilities of property managers.

7. Allied A - Affordable Housing

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Introduction and Importance of housing in urban and regional development
2	<ul style="list-style-type: none">● Critical issues in the affordable housing sector
3	<ul style="list-style-type: none">● Affordable Housing demand, Typologies, finance, etc
4	<ul style="list-style-type: none">● Structural concepts, use of traditional and new building materials, self-help housing, incremental housing.
5	<ul style="list-style-type: none">● Affordable housing: Policy and practice in India

8. Allied B - Building Economics

Course contents:

Units	Contents of The Course
1	<ul style="list-style-type: none">● Economics and the market: Definition of terms like goods, utility, value, Consumption, wants and needs and their characteristics. Concepts of economics: Opportunity cost; Laws of supply and demand; Laws of increasing, diminishing and constant returns
2	<ul style="list-style-type: none">● Macroeconomics-Economic system in India. Economics in relation to Architecture, Meaning and scope of building economics, Issues and challenges associated with building projects. Building Efficiency, Building Life-cycle. Costs and Benefits of Building – Monetary Non-Monetary
3	<ul style="list-style-type: none">● Standard of living. Analysis of the housing market in Indian cities to understand the dynamics of urban housing supply and demand
4	<ul style="list-style-type: none">● Urban land values: Various factors affecting the value of urban land. Difference between land use and land cover. The characteristics of developed land in the city
5	<ul style="list-style-type: none">● Building Costs: Cost and cost indices. Life cycle costs. Total cost of construction. Time value of money. Different sources of financing buildings
6	<ul style="list-style-type: none">● Project Financing Equity, Financing Institutions in Financing Process, Interim Finance and Permanent Financing, Bank Loan - Simple Interest and Compound Interest. Types of Mortgage, Lease Arrangements

9. Allied C - Introduction to Archaeology

Course contents:

Units	Contents of The Course
1	Introduction to the field and background, significance to the field of Archaeology.
2	Fundamentals of archaeological methods and multidisciplinary approaches. Exploration methods- surface, subsurface and aerial survey etc. Methods of excavation- horizontal and Quadrant excavation methods etc.
3	Methodologies and challenges inherent in archaeology. Dating, documenting and Post-excavation analysis
4	Contributions of Important Indian archaeologists and Important Archaeological Sites in India
5	Major sub-disciplines of Archaeology and Its relations with other disciplines

1. Audit Course : DISASTER MANAGEMENT

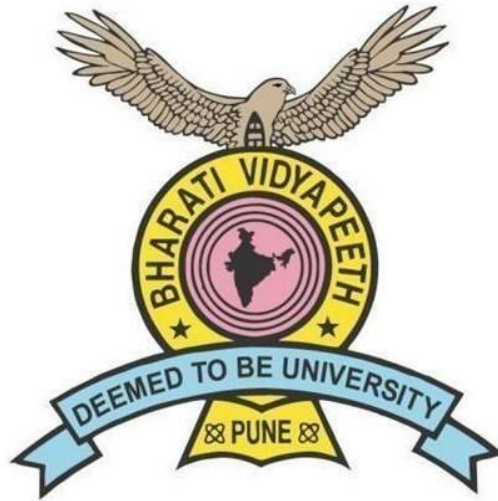
Course contents:

Objective of the Course	
<ol style="list-style-type: none"> 1. To provide basic conceptual understanding of disasters. 2. To understand approaches of Disaster Management 3. To build skills to respond to disaster 	
Units	Contents of the Course
1	Introduction to Disaster and its types <ul style="list-style-type: none"> ● Definition and types of disaster Hazards and Disasters, Risk and Vulnerability in Disasters.
2	Disaster Classification <ul style="list-style-type: none"> ● Natural disasters: Earthquakes, floods, drought, landside, land subsidence, cyclones, volcanoes, tsunami, avalanches, and global climate extremes. etc. ● Man-made disasters: Terrorism, gas and radiations leaks, toxic waste disposal, oil spills, forest fires. ● Social Economics and Environmental impact of disasters.
3	Response ,mitigation Measures and Management <ul style="list-style-type: none"> ● Mitigation and Management techniques of Disaster Basic principles of disasters management, Disaster Management cycle, Disaster management policy, National and State Bodies for Disaster Management, Early Warning Systems, Building design and construction in highly seismic zones, retrofitting of buildings ● Awareness program and project on disaster management Training and drills for disaster preparedness, ● A brief Report on Workshop or Live demonstration conducted by local planning authority is desirable

NOTE	The evaluation of the audit course of 'Disaster Management' will be done by internal examiners based on the report submitted by the students.
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Learning Resources:

1	Disaster Management Guidelines, GOI-UND Disaster Risk Program (2009-2012)
2	Damon, P. Copola, (2006) Introduction to International Disaster Management, Butterworth Heineman.
3	Gupta A.K., Niar S.S and Chatterjee S. (2013) Disaster management and Risk Reduction, Role of Environmental Knowledge, Narosa Publishing House, Delhi.
4	Murthy D.B.N. (2012) Disaster Management, Deep and Deep Publication PVT. Ltd. New Delhi.
5	Modh S. (2010) Managing Natural Disasters, Mac Millan publishers India LTD
6	Disaster Management in India <u>Rajendra Kumar Pandey</u> - Faculty at Chaudhary Charan Singh University, Meerut



FOURTH YEAR B. ARCH. CBCS-2020

(Contents Semester VII & VIII)

For

Bachelor of Architecture (B. Arch) Programme

Bharati Vidyapeeth (Deemed to be University)

College of Architecture, Pune

=



Prof. Dr. Shivajirao Kadam
Chancellor
M.Sc., Ph.D.

Prof. Dr. Vivek A. Saoji
Vice Chancellor
M.B.B.S., M.S.(Surg.)

Bharati Vidyapeeth (Deemed to be University) Pune, India.

Founder Chancellor : Dr. Patangrao Kadam

★ Accredited with 'A+' Grade (2017) by NAAC ★
★ Category-I University Status by UGC ★
★ NIRF Ranking - 76 ★

"Social Transformation Through Dynamic Education"



Dr. Vishwajeet Kadam
Pro Vice Chancellor
B.Tech., M.B.A., Ph.D.

G. Jayakumar
Registrar
M.Com., Dip.Pub.Adms.

NOTIFICATION NO. 1205

It is hereby notified for the information of all concerned that the Academic Council, at its 68th meeting held on 23-5-2023 has resolved to approve the revised syllabi, course structure of Fourth year B.Arch. and Third year B.Tech. programmes in CSE(AI&ML) & CSBS of 2020 batch, Fourth year B.Tech programmes of 2020 Batch and First year M.Tech. programmes of 2023 batch as detailed below :

Sr. No.	UG : Batch 2020	First year PG (Batch 2023)
1	4 th year B. Arch.	M.Tech. (Chemical)
2	3 rd year B.Tech. (AI & ML)	M.Tech. Civil (Water Resources Engineering)
3	3 rd yr. & 4 th yr. B.Tech. (CSBS)	M.Tech. (Computer Engineering)
4	4 th year B.Tech. (Chemical)	M.Tech. (IT)
5	4 th year B.Tech. (Civil)	M.Tech. (Electrical)
6	4 th year B.Tech. (CE)	M.Tech. (ECE)
7	4 th year B.Tech (IT)	M.Tech.(Mechanical)
8	4 th year B.Tech. (CSE)	M.Tech. (Nano Technology)
9	4 th year B.Tech. (Electrical)	
10	4 th year B.Tech. (ECE)	
11	4 th year B.Tech. (E&TC)	
12	4 th year B.Tech. (Mechanical)	
13	4 th year B.Tech. (RAC)	

This is for the information of all concerned.

Ref. No. BVDU/2023-2024/737

Date: July 14, 2023

To,

1. The Principal, College of Engineering, Pune
2. The Principal, Dept. of Engineering & Technology, Navi Mumbai
3. The Dean, Faculty of Engineering & Technology, College of Engineering, Pune.
4. The Ph.D. Section, BVDU
5. The Controller of Examinations, BVDU
- ✓ 6. The IT Cell for uploading in the Website.

AC23-5-2023(68-5.8)

G. Jayakumar
Registrar

SEMESTER VII

Fourth Year B Arch.

Architectural Design -VII

Course Code: KHMU71	Course Category: Professional Core		Semester: VII
Credits:	10	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	8	Sessional Oral (SO)	60 Marks
Workshops or studio exercises/ week	1	Sessional (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	180 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	150 Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	30 Hours

Course Objectives:

1. To Introduce students to theories in the context of multi-storey development.
2. To understand, explore and demonstrate strategies, modern technologies and services for integration in the context of urban of multi-storey development.
3. To examine and imbibe a socially, environmentally and economically sustainable built environment in compliance with National building code, ECBC and state guidelines (context specific) and Eco-Niwas Samhita codes - 2021.
4. To analyse and develop skills and strategies for designing Sustainable multi storey projects in the given context.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Remembering	Recognize the significance of sustainable multi storey project. Historical development of the Indian context.
2.	Understanding	Understand the factors affecting and strategies for designing sustainable multi storey project in urban context with reference to Sustainable Development Goals (SDGs), Energy Conservation Building Code, Eco-Niwas Samhita codes 2021.
3.	Applying	Applying the National Building Code and state guidelines (context specific) such as Eco-Niwas Samhita codes, modern technology and services etc.
4.	Analysing	Analyse built environment as a complex set of arrays, comprising multiple spaces, form, circulation, services and technology with the lens of sustainability.
5.	Evaluating	Evaluate potential strategies for social, environmental and economical sustainability for application in multi storey project.
6.	Creating	Create a Sustainable multi storey complex by integrating the modern technology and services.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of : Theories on neighbourhood planning concepts, community living, campus planning principles etc.	16
Unit -II	Pre-Study based on the: National building code and state guidelines (context specific), Sustainable Development Goals (SDGs), Energy Conservation Building Code, Eco-Niwas Samhita codes and modern technology and services.	16
Unit -III	Exploration of: Potential strategies for social, environmental and economical sustainability for application in multi storey projects.	16
Unit-IV	Analyse: Factors affecting and the strategies for designing sustainable multi storey projects in urban context.	16
Unit-V	Design: Spatial design of built spaces, synthesize and translate analytical understanding of previous modules into architectural design for: Sustainable multi storey complex integrating the modern technology and services Built Up considerations :6000-10000 Sq. m.	54
Unit-VI	Create: Projects like club house, shopping centre, multipurpose hall kindergarten and creche, etc. Built Up considerations: min.750 Sq. m.	32
Total Contact Hours		150

Learning Resources:

1.	Alexander C., Ishikaw S., Silverstein M. & Jacobson, <i>A Pattern Language</i> , Town, Buildings, Construction, Oxford University Press.
2.	Alexander C., Ishikaw S., Silverstein M. & Jacobson, <i>A Timeless way of Buildings</i> , Oxford University Press.
3.	Bacon E. N., (1976), <i>Design of Cities</i> Revised Edition, USA and Penguin Books.
4.	Lang J., (1994) <i>Urban Design: The American experience</i> , John Wiley & Sons,
5.	Jain K. B., (2011), <i>Architecture Conceptual to the Manifest</i>
6.	Cullen G., (1971), <i>The Concise Townscape</i> , New York, USA, Architectural Press, Routledge
7.	Lang J. T. , Desai M. & Desai Madhavi, (1997) <i>Architecture and independence: the search for identity--India 1880 to 1980</i> , USA, Oxford University Press
8.	Lynch K., (1960, 1990), <i>The Image of the City</i> , Massachusetts Institute of Technology Cambridge, Massachusetts, and London, England, The M.I.T. Press (20th Printime)
9.	Eco-Niwas Samhita 2021.

Fourth Year B Arch.

Interior Design

Course Code: KHMU72	Course Category: Professional Core		Semester: VII
Credits:	4	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	2	Sessional Oral (SO)	60 Marks
Workshops or studio exercises / week	1	Sessional (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	72 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	60 Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	12 Hours

Course Objectives:

1. To design interior spaces of residential or commercial buildings.
2. To design all necessary details and services for interior layout.
3. Develop competence for working with various materials and construction techniques used in interior design with reference to current market trends.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	The factors affecting and method of designing with reference to Interior Design of a residential or commercial unit.
2.	Analysing	Interior spaces and the need for building services in residential or Commercial design.
3.	Creating	Interior design layout and detailed layouts inclusive of building services, specifications and estimates for residential or commercial spaces.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Study of: Principles of Interior Design and various parameters such as carpet areas, furniture sizes, measurements, scale, proportion. Introduction to parameters such as structural layouts, material finishes, building services such as plumbing, drainage, electrical, lighting, mechanical ventilation and air conditioning systems, acoustics, fire fighting etc.	8
Unit -II	Pre study based on: Interior layouts of residential or commercial units with examples of significant case studies done at Global level and in the Indian context with reference to materials, finishes, building services.	4
Unit -III	Identifying: Residential or commercial unit (size 80 sq. m to 100 sq. m) and finalizing a schematic interior design of furniture layout of each room.	12
Unit-IV	Exploration of: Alternatives of materials and finishes used in interior designs and brief estimation of the materials including techniques of applying/using materials (specifications), building services, with reference to market study.	4
Unit-V	Design focus of: Interior of each space of the selected unit and layouts of building services such as plumbing, drainage, electrical, lighting, mechanical ventilation and air conditioning systems, acoustics, fire fighting etc.	20
Unit-VI	Creating: Project portfolio including presentation drawings and GFC's (good for construction drawings) including a brief estimate of the project.	12
Total Contact Hours		60

Learning Resources:

1.	John Coles and Naomi, (2007) the fundamentals of interior architecture/AVA Publishing SA
2.	Mitchiel Beazley (2004), the new color book/octopus publishing group ltd.
3.	Julie Savill (2001), Good homes magazine (101 color schemes that really works) BBC worldwide
4.	www.quadrille.co.in
5.	www.theaid.in
6.	International journal of interior architecture and spatial design
7.	magazine published by IIID "insite"

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Urban Planning

Course Code: KHMU73	Course Category: Professional Core		Semester: VII
Credits:	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	60 Marks
Workshops or studio exercises / week	2	Sessional (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching Sessional Work	15	No.s of Hours for Teaching Sessional Work	45 Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	09 Hours

Course Objectives:

1. To give an introduction and overview of urban planning and its dynamics with architecture. The various aspects involved in the planning and development of cities and regions.
2. To understand the planning procedures at various levels of planning.
3. To understand the importance of Town Planning with respect to legislative guidelines, through Acts and Byelaws.
4. To develop an urban vocabulary required to understand urban form and public spaces.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	To know and recognize different types of planning aspects and its basic concepts. To comprehend and interpret different influencing factors of evolution and principles of cities.
2.	Creating	To interpret and appraise the relevance of legislation and policies. To design various design proposals and layouts for public spaces.
3	Analysing	To determine and relate various planning aspects for development of cities and regions. To identify, illustrate and relate the current issues of city planning and its impact.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Introduction to the basics aspects of Planning: Introduction to the basic concepts in planning like land use, zoning, byelaws etc. Need and importance of study of Rural, Town, Urban Planning for an Architect.	6
Unit -II	Urbanization and Its Impacts: Study of contemporary issues and concerns in the urban development of the City. Characteristics of urban housing.	9
Unit -III	Evolution and principle of urban settlement: Introduction to evolution of settlements and cities. Principles, Characteristics and influences on Indus cities, Egyptian cities, Greek cities, Roman cities, Industrial cities etc. Suggested theories by Patrick Geddes; Kevin Lynch; Clarence Perry; Frank Lloyd Wright; Ebenezer Howard; Le Corbusier, C.A. Doxiadis, Lewis Mumford etc.	9
Unit-IV	Different planning aspects impacting / influencing city Development: Importance of Transport planning, heritage planning, Landscape planning, Environmental planning, Housing and slum development, disaster management for holistic development of city planning. Study the role and significance of issues based on topographical, geographical, social, economic and cultural aspects etc.	6
Unit-V	Introduction to Planning Legislation and policies: Introduction to various planning related laws, their contents and provisions, namely M.R.T.P. Act of 1966, Land Acquisition Act, Maharashtra Slum Redevelopment Act, Urban Arts Commission Act, Municipal Act, etc. Introduction and significance of National Missions, infrastructure development schemes and contemporary schemes like JNNURM, HRIDAY, AMRUT, Smart city, URDPFI, etc.	6
Unit-VI	Introduction to Urban Design: Brief Study of terminologies like urban morphology, urban structure, urban fabric, urban grain, urban texture etc. Definitions and Elements, related to urban design with examples. Introduction to new concepts like Livable environment, Walkability, City and its aesthetics, vertical urbanism etc.	9
Total Contact Hours		45

Learning Resources:

1.	Pattern Language, Christopher Alexander.
2.	Lewis Mumford (1972) <i>The City in History: Its Origins, Its Transformations, and Its Prospects</i> . USA, Harcourt, Inc.
3.	Anthony J. Catanese, James C. Snyder (2014) <i>Urban Planning</i> . New Delhi, McGraw Hill Education Private Limited.
4.	Abir Bandyopadhyay, (2010) <i>Town Planning</i> , Kolkata, Arunabha Sen.
5.	Peter Geoffrey Hall (1996 Updated Edition) <i>Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century USA</i> , Blackwell publishing.

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Research in Architecture

Course Code: KHMU74	Course Category: PAEC		Semester: VII
Credits:	4	Internal Assessment	40 Marks
Lectures per week	2	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises / week	2	Sessional (SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	72 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching + Sessional Work	60 Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	12 Hours

Course Objectives:

1. To improve the architectural vocabulary.
2. To acquaint the student with various types of Architectural research.
3. To improve upon the analytical and appreciative approach towards research work.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	To understand the importance and relevance of other's research.
2.	Analysing	To choose and apply the most appropriate methodology with respect to your research question. To acquire, correlate appropriate vocabulary to describe architectural concepts and design in meaningful ways.
3.	Evaluating	To be enabled to conclude based on the study of observations collected. To formulate the document in a desired format based on measuring, rating and reviewing the collected information and /or data.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	Architectural Vocabulary: Introduction to technical and Creative writing in Architecture. Architectural Journalism, review and Criticism. Writing an architectural review article.	12
Unit -II	Introduction to research: • Meaning, need and significance of research. • Objectives and characteristics of research • Criteria for good research • Areas of research in sustainable architecture. • Ethics in research.	8
Unit -III	Introduction to research types and approaches: • Research Types ▪ Historic, Descriptive, Case study, Experimental, Applied and Causal, etc. ▪ Advantages and disadvantages of various research types • Research Approaches ▪ Qualitative ▪ Quantitative ▪ Mixed ▪ Advantages and disadvantages of various approaches. Literature Review - significance, process, references, bibliography etc. Literature review and sources for literature	12
Unit-IV	Research Design: Steps in conducting research ▪ Preparing Research Proposal ▪ Formulating research problem ▪ Sampling design ▪ Need for sampling ▪ Types of sampling design ▪ Criteria for sample selections.	8
Unit-V	Data collection: • Types of data • Tools for data collection (Survey, observation, interview, mapping, etc.) • Data presentation techniques • Introduction to analytical tools (Descriptive statistics, content analysis, visual analysis) • Interpreting results.	12
Unit-VI	Anatomy of an architectural research paper.	8
Total Contact Hours		60

Learning Resources:

1.	Ranjit Kumar, Research Methodology: A Step by Step Guide for Beginners, SAGE publications Ltd., 2011.
2.	C. R. Kothari, Research Methodology: Methods and Trends, New Age International, 2004
3.	S.D. Sharma, Operational Research, Kedar Nath Ram Nath & Co.,1972
4.	Gary T Moore et al. Environmental Design Research Directions: Process and Prospect. New York: Preager Publishers, 1985.
5.	Henry Sanoff. Visual Research Methods in Design. New York: Van Nostrand Reinhold, 1991

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Advance Computer Application in Architecture

Course Code: KHMU75	Course Category: SEC		Semester: VII
Credits:	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	60 Marks
Workshops or studio exercises / week	2	Sessional (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching+ Sessional Work	15	No.s of Hours for Teaching+ Sessional Work	45 Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	09 Hours

Course Objectives: Enable students to understand and apply

1. Digital tools in Architecture Engineering and Construction (AEC) and sustainable design with an emphasis on building information modelling such as (BIM) Revit, GIS, CLIMATE CONSULTANT, ECO TECT, GRASSHOPPER and RHINO etc.
2. Skills and information to build comprehensive Building Information Models using appropriate digital software and media.

Course Outcomes:

Co. No.	Cognitive Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	Understanding the basics & interfaces of climate analysis tools & Advance building information management tools.
2.	Applying	The implementation of BIM, GIS, CLIMATE CONSULTANT, ECO TECT, GRASSHOPPER and RHINO etc. to integrate with 3D built environment.
3.	Creating	To generate analysis in graphical & statistical format using climate analysis tools & Advance building information management tools, e.g., BIM, GIS, CLIMATE CONSULTANT, ECO TECT, GRASSHOPPER and RHINO etc.

Course Contents:

Units	Contents of The Course	Hours
Unit -I	<p>Introduction to Revit:</p> <p>Introduction to Revit Architecture, Starting a New Architectural Project , Creating Walls, Using Basic Building Components I, Using the Editing Tools, Datum Planes and Creating Standard Views, Using Basic Building Components II, Using Basic Building Components III, Adding Site Features, Using Massing Tools, Adding Annotations and Dimensions, Creating Project Details and Schedules, Creating Drawing Sheets and Plotting, From Rendering to Walkthroughs, Using Advanced Features I, Using Advanced Features II.</p>	9
Unit -II	<p>Introduction to BIM:</p> <p>Key concepts of BIM - reading and manipulating the software Interface - navigating within views - selection methods - the importance of levels and grids- create walls, doors, windows, and components - working with essential modification commands and load family. Creating floors, Ceilings and stairs - working with type and instance parameters – importing drawings - understanding the project browser and type properties palettes.</p>	6
Unit -III	<p>Advanced Modelling:</p> <p>Family Types and Topo Surface Modelling - Creating curtain walls, schedules, details, a custom family, and family types - “flex” a family with family types and work with reference planes - creating rooms and an area plan – tag components - customize existing wall styles. Create and edit a topo-surface, add site and parking components - draw label contours - work with phasing - understand groups and links work with stacked walls - and learn the basics of rendering and create a project template.</p>	6
Unit-IV	<p>Introduction to GRASSHOPPER & RHINO:</p> <p>Introduction to software and its uses in various new ways to propound with 3D architectural modelling processes also automates the recurring process, generates geometrical figures through mathematical functions, iterations are faster even in complex models, and creates complex models through simple geometry.</p>	9
Unit-V	<p>Introduction to GIS, CLIMATE CONSULTANT:</p> <p>Introduction to software and its uses in various planning & building modelling.</p>	9
Unit-VI	<p>Introduction to ECO TECT:</p> <p>Introduction to software and its uses in calculating building's energy consumption by simulating its context within the environment.</p>	6
Total Contact Hours		45

Learning Resources:

1.	BIM Handbook: A Guide to Building Information Modelling for Owners, Managers, Designers, Engineers and Contractors
2.	E Books: Revit https://images.autodesk.com/adsk/files/revit_architecture_2011_user_guide_en.pdf
3.	E Books: Rhino https://wiki.mcneel.com/_media/training/rhino_for_arch/rhinoceros_in_architecture_course.pdf .

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Elective – VII and VIII

Course Code: KHMU76	Course Category: PE		Semester: VII
Credits:	3	Internal Assessment	40 Marks
Lectures per week	1	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises/ week	2	Sessional (SS)	60 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	54 Hours
No.s of Weeks for Teaching + Sessional Work	15	No.s of Hours for Teaching + Sessional Work	45Hours
No. of weeks for Assessment	3	No. of Hours for Assessment	09 Hours

Note: Following is the list of electives under various streams for semester VII to facilitate choice to learners in selecting courses of their own interest. Any two of the following electives of two streams can be chosen by the learner. Course details of Electives chosen are in **Annexure 5**.

Course Objectives:

1. To facilitate the students to learn out of a pool of specialized courses, which provides extended scope or which enables exposure to discipline-centric courses as well as cross-disciplinary courses.
2. To encourage interdisciplinary learning and imbibe values as learners.
3. To give students an opportunity to develop their attitudes and skills in a subject they may opt for making a career.

Course Outcomes:

CO No.	Affective levels	On successful completion of course the learner will be able to:
1.	Receiving	Identify and describe the aspects or issues of offered contents.
2.	Responding	Report case study.
3.	Valuing	Justify their ideas /opinions in relation to contents of elective.
4.	Organization	Document and present the data collected in a systematic way.
5.	Internalizing	Display a technical base through in depth study.

Electives:

Semesters		Design	Technology and Management	Allied (Art, legalities, culture, environment, etc)
Sem-VII	A	Product Design	Long Span Structures	Gender in Architecture
	B	Architectural Conservation	Disaster Resistant Structures	Behaviour Psychology
	C	Healthcare Design	Prefabricated and Prestressed Structures	Ergonomics
	D	Critical Thinking of Modern Architecture	Steel Structures	Housing Laws and Policies
	E		Design Management	Artificial intelligence and user experience
	F		Business Management	Traffic Awareness - Road Safety and Civic Sense

ANNEXURE 5

Learning Resources:	As per topic chosen.
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Design A_ Product Design

Course contents:

Units	Contents of The Course
1	A brief introduction to product designing and its various elements. History of product design, role of product designers. Why product design? Future of product design.
2	Introduction to applied anthropometry, fundamentals of ergonomics, human activities, their nature and application of human factors' data in product design development.
3	Understanding of product development cycle and phases. Mind Maps, Information input and processing.
4	Multiple utility-oriented approach to product design. Product design as an umbrella term.
5	Prototyping: Basics, principles, technologies and planning, Execution.

Design B_ Architectural Conservation

Course contents:

Units	Contents of The Course
1	Introduction to need and importance of architectural conservation.
2	Basic Principles of Conservation and economic viability, Historic building related issues maintenance, management problems and remedial measures.
3	Heritage bylaws. Laws and legal frame for heritage conservation.
4	International and National approach to conservation: Role of UNESCO, other allied bodies and institutions, ASI, INTACH. World Heritage sites.
5	Conservation Practices <ul style="list-style-type: none">● Overview of conservation practices.● Various disciplines and expertise involved.● Ethics of Conservation Concepts of grading heritage.

Design C_ Healthcare Design

Course contents:

Units	Contents of The Course
1	Introduction to the need and importance of Healthcare Design.
2	Understanding the multiple ways the built environment impacts user experiences, healing healthcare design concepts.
3	Concepts of design for wellbeing, such as why space matters, spatial research methodologies and well-built standards.
4	Unique skills needed to brief the design of spaces and critically evaluate the spaces we inhabit and which impact our health and wellbeing.
5	Aspects of the design process, briefing, design thinking and communication skills.

Design D_ Critical Thinking of Modern Architecture

Course contents:

Units	Contents of The Course
1	Rationalism, Industrialization and the search for principles.
2	Secessionism and self-conscious modernity.
3	Paradigm of 20th century Modernism.
4	Contemporary and Postmodern architecture including Parametric design.
5	Contextualizing the Present.

Technology and Management A _ Long Span Structures

Course contents:

Units	Contents of The Course
1	Definition and need of long span structures, history, modern architectural requirements.
2	Shell structure like single curvature and double curvature etc. Structural action and various components, advantages and limitations, applications, Case studies.
3	Folded slab structure: Structural action and various components, Advantages and limitations, applications, Case studies.
4	Tensile Structures like membrane, cable net and air supported etc.: Structural action and various components, Advantages and limitations, applications, Case studies.
5	Grid structure and skeletal like Space frames etc.: Structural action and various components, Advantages and limitations, applications, Case studies.

Technology and Management B _ Disaster Resistance Structures

Course contents:

Units	Contents of The Course
1	Various types of disasters such as Earthquake; Fire; Flood; Cyclone; Tsunami; Other natural disasters.
2	Behaviour of buildings under various disaster conditions.
3	Introduction to building codes and guidelines of planning, space arrangement and space requirements for disaster resistant buildings.
4	Structural non-structural aspects of disaster resistant structures responding to various disaster conditions as Earthquake; Fire; Flood; Cyclone; Tsunami; Other natural disasters. Site and its vulnerability to disaster, Urban aspect of disaster management.
5	Introduction to retrofitting of old buildings for resistance to disaster conditions as Earthquake; Fire; Flood; Cyclone; Tsunami; Other natural disasters.

Technology and Management C _ Prefabricated and Prestressed Structures

Course contents:

Units	Contents of The Course
1	Prefabricated Structure - History of Prefab architecture - 19th, 20 th , 21st century and contemporary. (Case study based), principles, need, policy of government, terminology of prefabricated structures. Various structural elements, types of moulds, materials.
2	Requirements of plans, specifications for prefabricated structures. Modular coordination, architectural treatment and finishes; types of prefabrication systems; factors governing selection of suitable prefabrication systems; Design consideration (as per IS 15916-2011 code); design requirements for safety.
3	Requirements for joints; sampling procedure, tests for components/structures; manufacturing process of components, stacking of components, transportation and erection procedure of prefabricated structure, connection details, waterproofing, Prestressed structures - Historical background, need and requirement of prestressed conc.: concept of prestress, materials, specifications.
4	Various pre tensioning and post tensioning systems, concept of cable profile, various aspects of cable profile and importance, Simple problem on cable profile, types of losses (concept only), concept of stresses (simple problem), endblock stress (explanation only).
5	Reinforcement and cable detailing of prestressed rectangular, flanged beam and slabs. (On drawing sheet) Case study - Sydney opera house, Ocean heights (Dubai), Capital Gate (Abu Dhabi), ICC tower (Hong kong), Zagreb International Airport (Croatia), Cable stayed bridge, or similar structures.

Technology and Management D _ Steel Structures

Course contents:

Units	Contents of The Course
1	Introduction to steel structures as low rise and high-rise buildings.
2	Study of Spans in Steel structures for long span structures, industrial structures, warehouses, containers.
3	Study of various elements such as horizontal, vertical, inclined in steel structures.
4	Joinery details and fabrication techniques while assembling or erecting Steel structures.
5	Types of Various finishes and role of protective coating to steel structures.

Technology and Management E _ Design Management

Course contents:

Units	Contents of The Course
1	Introduction of design management.
2	Principles Of Design Management.
3	Drawing and Documentation Management. Planning, Scheduling. Material and their Management implementation production handling.
4	Finance Management funding incubation.
5	Computer Applications for Design Management.

Technology and Management F _ Business Management

Course contents:

Units	Contents of The Course
1	Introduction to Meaning and Process of Management.
2	Business and Society origins of business business theories.
3	Functions of management - Planning Decision-making Organizing Delegation, Directing implementation etc.
4	Principles of Marketing Management.
5	Business Finance and Financial Institutions.

Allied A - Gender in Architecture

Course contents:

Units	Contents of The Course
1	Gender as demographics, theories and statistical prescription.
2	Gender inclusions: governing laws and policy in India and International.
3	Parameters for creating gender neutral spaces and safety audits for gender inclusion.
4	Research for gender inclusive architecture.
5	Identifying examples and best practices of Gender inclusive public spaces.

Allied B - Behaviour Psychology

Course contents:

Units	Contents of The Course
1	Defining the field of Behaviour psychology. Origins and history. Behaviour psychology's links with the physical environment. Environmental 'influences' on human cognition and behaviour.
2	Introduction to Theories of Behavior psychology by the Pioneers (such as Seta M. Low, Jan Gehl, William Whyte, Roger Barker, Edward Hall, etc.) and their contribution.
3	Introduction to Place-related theories in environmental psychology and various concepts like privacy, personal space, perception, cognition, environmental stressor, spatial behaviour, wayfinding, etc.
4	Application of the theories in the physical environment at micro scale.
5	Application of the theories in the physical environment such as urban design, landscapes etc. as well as macro scales.

Allied C - Ergonomics

Course contents:

Units	Contents of The Course
1	Introduction to Human Function: Human beings in the manmade world and the importance of ergonomics, Gross human anatomy, Ergonomics for children at the workplace and old people.
2	Ergonomics and Design: Introduction to Anthropometrics, static and dynamic anthropometrics, Muscles and work physiology, Static and Dynamic work including maximum capacity.
3	Disability, Ageing and Inclusive Design: Built environment for the physically handicapped, Ramp, toilets and corridor design, Spatial Requirements for wheelchair movement-Design issues in the design of old age homes, Criteria to be considered when designing for the visually impaired.
4	Health Effects of Environmental Stressors: Controls and displays, psycho psychological aspects of Design, Occupational hazards in work environment, Visual stress, Postural Stress, Stress due to commuting.
5	Universal design: Design of special elements in buildings for physically challenged and old aged design exercises like - <ul style="list-style-type: none">● Design of Household elements, tools and devices.● Design of furniture.● Design of Industrial Product - Automobiles and Electrical.● Element design for differently able, old and children.

Allied D - Housing Laws and Policies

Course contents:

Units	Contents of The Course
1	Introduction, application and differences between laws and policies w.r.t to housing in India.
2	Housing one of the basic needs, Security and Comfort; Investment, Housing Policy.
3	Brief overviews of Laws relating to Real Estate.
4	Modes of Transfer of Land Intervivos, By Inheritance, By Succession Certain Specific transfers - Cooperative societies, MHADA, Apartments Leasehold land etc.
4	Introduction to Acquisition under the Right to Fair Compensation Act Land Acquisition Act.

Allied E -Artificial intelligence and user experience

Course contents:

Units	Contents of The Course
1	Introduction to terms Artificial intelligence and user experience.
2	Intelligent systems – definition, types of intelligence. User experience design Principles.
3	Introduction to architecture and structural Artificial intelligence. Interaction design and agentive artificial intelligence. Algorithmic experiences and evaluative artificial intelligence.
4	Data Privacy and ethics in artificial intelligence.
5	Design of artificial intelligence product experiences. Human and Societal Considerations.

Allied F- Traffic Awareness - Road Safety and Civic Sense

Course contents: As per the Council of Architecture (New Delhi) circular Ref. No. CA/377/2021 (Syllabus /Traffic)

Road Safety and Civic Sense

Credit: 01

Duration: 01 hour/week

Objective: To introduce the concepts, principles, tools and aids of Road Safety and Civic Sense to the students of B.Arch. To acquaint them with the design and safety standards for roads. Also inculcate the practice of safe road behaviour and civic sense among them.

Methodology: Lectures, Tutorials and Case Studies.

1. Introduction to Road Safety

Road as an active space, Types of Users, User Behaviour, Sensory Factors like Vision and Hearing in User Behaviour.

Types of Vehicles: Heavy Vehicles, Light Motor Vehicle, Two Wheelers, Auto-Rickshaw, Bicycles and Cycle Rickshaw, Non-Motorised Vehicles.

Vehicle Characteristics: Dimensions, Weight, Turning Radii, Braking Distance, Lighting System, Tyres, etc.

Type of Hazards: Conflicts and Accidents.

2. Typology of Roads: Components and Design

Road Classification: National Highways, State Highways, District Roads (MDR and ODR), Village Roads

Urban Road Classification: Expressways, Arterial, Sub-Arterial, Collector, Local, Service Roads, One-Way, Two-Way etc. Mountainous Roads. Speed Limits of the Road types.

Design of Roads: Cross-Sectional Elements- Right of Way, Carriageway, Median, Shoulders, Sidewalk, Lanes, Cycling Track, Green Strip, Curbs, Camber, etc. Spatial Standards for the Cross-Section Design.

Relationship between Road Design and Road Safety.

3. Intersections

Types of Road Intersections: Basic Forms of at-grade Junctions (T, Y, Staggered, Skewed, Cross, Scissors, Rotary, etc. Grade Separated Junctions (with or without interchange): Three-Leg, Four-Leg, Multi-Leg, etc.

Design of Intersections: Design and Spatial Standards for Traffic Islands, Turns, Turning Radii, Directional Lanes, Pedestrian Crossings, Median Openings, Traffic Calming Components like Speed Breakers and Table-Top Crossings etc.

Design Considerations for Diverging, Merging, and Weaving Traffic.

Location and Design for Traffic Signals.

4. Pedestrian Circulation and Barrier Free Design

Requirement of Pedestrian Infrastructure: Sidewalks and Footpaths, Recommended Sidewalk Widths, Pedestrian Crossings, Pedestrian Bridges, Subways, Cycle Tracks, etc.

Barrier Free Design: Location and Design Standards for Ramps for Wheel Chair Access, Other Provisions like Tactile for Visually Challenged etc.

Safety Provisions: Pedestrian Railings, Anti-skid Flooring, Pedestrian Signal, Walk Button, etc.

5. Traffic Signs and Road Markings

Type for Traffic Signs: Principles and Types of Traffic Signs, Danger Signs, Prohibitory Signs, Mandatory Signs, Informatory Signs, Indication Signs, Direction Signs, Place Identification Signs, Route Marker Signs, etc. Reflective Signs, LED Signs. Static and Dynamic Signs.

Standards for Traffic Signs: Location, Height and Maintenance of Traffic Signs

Types of Road Markings: Centre Lines, Traffic Lane Lines, Pavement Edge Lines, No Overtaking Zone Markings, Speed Markings, Hazard Markings, Stop Lines, Pedestrian Crossings, Cyclist Crossings, Route Direction Arrows, Word Messages, Marking at Intersections, etc.

Material, Colour and Typography of the Markings.

6. Traffic Signals, Traffic Control Aids, Street Lighting

Traffic Signals: Introduction, Advantages, and Disadvantages

Signal Indications: Vehicular, Pedestrian and Location of the Signals.

Signal Face, Illustration of the Signals. Red, Amber, Green Signals and its Significance, Flashing Signals

Warrant of Signals, Co-ordinated Control of Signals



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Traffic Control Aids: Roadway Delineators (Curved and Straight Sections), Hazard Markers, Object Markers, Speed Breakers, Table Top Crossings, Rumble Strips, Guard Rails, Crash Barriers etc.

Street Lighting: Need for Street Lighting, Type of Lighting, Illumination Standard, Location and Intermediate Distance.

7. Road Accidents

Nature and Types of Road Accidents (Grievously Injured, Slightly Injured, Minor Injury, Non-Injury, etc.)

The situation of Road Accidents in India (Yearly), Fatality Rates, etc.

Factors (and Violations) that cause accidents, Prevention and First Aid to Victims

Collision Diagrams and Condition Diagrams exercises.

Traffic Management Measures and their influence in Accident Prevention.

8. Road Safety and Civic Sense

Need for Road Safety, Category of Road Users and Road Safety Suggestions.

Precautions for Driving in Difficult Conditions (Night, Rain, Fog, Skidding Conditions, Non-Functional Traffic Lights, etc.)

Types of Breakdowns and Mechanical Failures. Accident Sign (Warning Light, Warning Triangle, etc.)

Introduction to Concept of Civic Sense and its relationship to Road Safety: Importance of Civic Sense, Road Etiquettes and Road User Behaviour, Rules of Road, Right of the Way. Providing Assistance to Accident Victim. Sensitisation against Road Rage.

9. Traffic Regulations, Laws & Legislations

Indian Motor Vehicles Act (Chapter VIII: Control of Traffic to be discussed in detail)

Regulations Concerning Traffic: Cycles, Motor Cycles and Scooters, Rules for Pedestrian Traffic, Keep to the Left Rule, Overtaking Rules, Turning Rules, Priority Rules, Hand Signals, etc.

Speed and Hazard Management. Penal Provisions.

National Road Safety Policy, Central Motor Vehicle Rules, State Motor Vehicle Rules

Introduction to Good Practices.

Suggestive Readings:

1. Introduction to Traffic Engineering, R Srinivasa Kumar
2. Traffic Engineering and Transport Planning, LR Kadiyali
3. Book on Road Safety Signage and Signs, Ministry of Road Transport and Highways, Government of India
4. MORT&H Pocketbook for Highway Engineers, 2019 (Third Revision)
5. Publications by UTTIPEC namely, Street Design Guidelines, UTTIPEC Guideline for Road Markings, UTTIPEC Guideline and Specification for Crash Barriers, Pedestrian Railing and dividers, UTTIPEC Standard Typical Crossing Design
6. Street Design Standards as provided in TimesSavers, Neuferts etc.
7. Publications by Indian Road Congress.



SEMESTER VIII

Fourth Year B Arch.

Practical Training

Course Code: KHMU81	Course Category: PAEC		Semester: VIII
Credits:	24	Internal Assessment	
Lectures per week	-	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	100 Marks
Workshops or studio exercises / week	-	Sessional (SS)	-
No.s of Weeks in Semester	18	No.s of hours in Semester	-
No.s of Weeks for Teaching+ Sessional Work	-	No.s of Hours for Teaching+ Sessional Work	-
No. of weeks for Assessment	-	No. of Hours for Assessment	90 working days

NOTE: Students should work in office of an Architect or Organization operating in an allied field of practice or research duly approved by the institution, under the mentorship of a registered architect having experience of minimum 10 years.

Training in foreign country shall be done under the registered architect of that country and to be approved and monitored by the Head of Institute. The student shall work at an Architect's office (Internship) as per the guidelines of COA, and approved by the Institute, for duration of mini. 90 working days in one semester.

In case of any emergency, a trainee may be permitted to change the training office /place of training once only during the entire period of training. He/she shall inform the Principal and coordinating teacher from the Institute and seek prior permission for such change. The total duration of the practical training shall be sum of the period of stay in different offices. It shall be in conformity with the duration of training as prescribed in the syllabus. The students should periodically report to the coordinating teachers from the Institute and keep the institute informed about his/her training. After successful completion of this course, students should be able to understand on-going construction work on sites, supervisory controls of an Architect in a Project.

Course Objectives:

1. To undertake practical training under the guidance of experts / professionals.
2. To Learn about architect's office management and learn about the process of design, execution, and management of a project.
3. To understand the gain the knowledge of market (Professional Practice) working with registered Architectural firm/company.

Course Outcomes:

Co. No.	Affective Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	<p>Understanding the complete cycle of practical training in the office and developing skills in professional behaviour along with the real-life situation of Professional Practice and to work with ethical and professional responsibilities.</p> <p>Understanding the Office administration, designing, detailed drawing, Presentation and Documentation, Surveying and Site visits etc.</p>

Course Contents:

Contents of The Course
<p>The Practical training undertaken at registered Architect's office should cover the following.</p> <ul style="list-style-type: none"> ● Making presentation drawings for client presentations, and municipal approval drawings of projects undertaken in the office- of at least one project each, duly attested by the supervising architect ● Visiting sites of ongoing projects undertaken by the office, photo documenting progress with appropriate descriptions, as per the directions of the supervising architect. Identifying various stages of work. ● Discussions, getting inputs from the Consultants on the ongoing projects undertaken by the office, documenting as per the directions of the supervising architect. Understanding the inputs to be given to the consultants and feedback from them. ● Understanding the impact of local conditions in the Design and method of execution of job / jobs. ● Understanding the basic working system of an architect's office, regularity in attendance, maintaining a daily log book of activities involved in the office, personnel & management and hierarchy of office staff. ● Prepare Working drawings & details of an Architectural project, under the guidance of supervising architect.

Submission Requirement:

- Prepare a separate report along with a formal log book & work diary.
- Student should maintain week wise work record in a diary to summarize the Work done in the office, site visits, meetings with clients, agencies, interaction with principal architect. This diary should be authenticated by the architect every month.
- Professionals should issue a certificate of performance to the student with respect to the work quality, overall approach and attitude towards work.

- Students should produce report, log book, work diary & some sample drawings with permission from the employer [to indicate the kind of work s/he has carried out] at the time of sessional -viva voce examination.

Learning Resources:

1.	Practical Experience: an Architecture Student's Guide to Internship and The Year Out by Igor Marjanovic, Katerina Ruedi Ray
2.	Towards a New Architecture by Le Corbusier

Fourth Year B. Arch.

Self-Study

Course Code: KHMU82	Course Category: PAEC		Semester: VIII
Credits:	6	Internal Assessment	-
Lectures per week	-	Terminal Paper	-
Studio Projects per week	-	Sessional Oral (SO)	-
Workshops or studio exercises/ week	-	Sessional (SS)	100 Marks
No.s of Weeks in Semester	18	No.s of hours in Semester	-
No.s of Weeks for Teaching +Sessional Work	-	No.s of Hours for Teaching + Sessional Work	-
No. of weeks for Assessment	-	No. of Hours for Assessment	-

NOTE: Students should carry out the Self-study subject course.

Course Objectives:

1. To imbibe in students a methodical process to an architectural design project.
2. To develop necessary skills to provide approach and directions in the design of architectural Projects.

Course Outcomes:

Co. No.	Affective Levels	On Successful Completion of course the learner will be able to:
1.	Understanding	Understand the architectural design project.
2.	Analysing	Analyse the literature review and analysis of previous work of architectural design project.
3.	Creating	Prepare the synopsis for architectural design project.

Course Contents:

Units	Contents of The Course
1	<ul style="list-style-type: none"> ● Synopsis for Architectural Design project. ● Identification of Case studies (Minimum two Book, live case studies) to understand the Project. ● Literature review minimum five research papers relevant to the architectural design project topic.
2	<ul style="list-style-type: none"> ● Detail self-study report on any Technology/ Sustainability Component, services related to the chosen topic.
OR	

2	<ul style="list-style-type: none">• Any one online MOOC Course preferably related to their Architectural Design Project. It may be a short-term course with documentation and certification.
---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Learning Resources:

1.	Books related to the topic selected by students.
----	--------------------------------------------------



**BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE**

**Faculty of Engineering and Technology
B. Arch (Bachelor of Architecture)
Old Syllabus**



**Revised Rules
Structure and contents of
Detailed Syllabus**

For

**Bachelor of Architecture (B. Arch) 2015 CBCS COURSE
(Amended in 2018)**

To be implemented from 2018-19

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune



Prof. Dr. Shivajirao Kadam
Chancellor M.Sc., Ph.D.

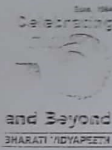
Prof. Dr. M. M. Salunkhe
Vice Chancellor M.Sc., Ph.D., F.R.S.C.

Bharati Vidyapeeth (Deemed to be University) Pune, India.

Founder Chancellor: Dr. Patangrao Kadam

★ Accredited with 'A' Grade (2017) by NAAC ★
★ Category-I University Status by UGC ★
★ NIRF Ranking - 66 ★

"Social Transformation Through Dynamic Education"



Dr. Vishwajeet Kadam
Pro Vice Chancellor B.Tech., M.B.A., Ph.D.

G. Jayakumar
Registrar M.Com., Dip. Pub. Adm.

NOTIFICATION NO. 925

It is hereby notified for the information of all concerned that the University authorities have decided to approve the revised syllabus of M.Arch. programme and B.Arch. programme by adopting the Council of Architecture's amendments in the existing B.Arch. 2015 CBCS syllabus (Sem VII-X) to be implemented from the academic year 2018-19.

All the concerned are requested to make a note of this.

Ref. No. BVDU/2018-19/ 906
Date : July 20, 2018

G. Jayakumar
Registrar

To,

1. The Dean, Faculty of Engineering & Technology, College of Engineering, Pune 43.
2. The Principal, College of Architecture, Pune 43.
3. The Controller of Examinations, BVDU.

Notification 2018-19

- Exam-Section cot
- Lib. note
- Academic-co or
- PG-VG.
- office file

Bharati Vidyapeeth (Deemed to be University) College of Architecture, Pune-43.	
Inward No.:	153
Date:	21.7.18
Sign:	


Changes in the contents of syllabus as per MOM of BOS meeting conducted on 24/12/2018

A meeting of Board of Studies in architecture was conducted on 24th December 2018 to discuss the feed by faculty members for implemented course of B.Arch CBCS 2015 and M.Arch CBCS 2018. Both the courses are approved through university notification 925 and in academic council meeting conducted on 4th December 2018. It is decided by the BOS in the meeting that the feedback should be carefully considered for next revision of syllabus in the syllabus formation meetings after detailed discussion. The specific suggestions for immediate action are follows for **B.Arch (CBCS 2015 course)**.

1. **Working Drawing I (B.Arch CBCS 2015 amended in 2018)**- 'Municipal Drawing' needs to be included over and above the contents of the syllabus .
2. **Elective V-Sustainable architecture (B.Arch CBCS 2015 amended in 2018)**, the contents are revised as follows:

Aim: To understand the principles and practices of sustainable architecture.

- Concept of sustainable development and its relation to built environment
- Understanding relationship between climate and human comfort
- Understanding sustainable building design principles and practices

 11/11/2019

Prof. Archana Gaikwad

Chairperson BOS in Architecture

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Rules of Structure for First To Fifth Year B. Arch

Rule No.1: Eligibility for Admission

Eligibility Criteria: Students seeking admission to First year of Bachelors Degree Course in Architecture must fulfill the eligibility criteria laid down by Council of Architecture and the University as applicable from time to time.

Rule No.2: Duration and stages of the course (as per Council of Architecture)

- The architecture course shall be of minimum duration of 5 academic years/ 10 semesters of approximately 18 working weeks each inclusive of 90 days of practical training in IX semester in a professional's office.
- The 5 years Bachelors Degree Course in Architecture shall be conducted in two stages.
- The First stage of the course shall be the first 3 academic years or 6 semesters of institutional academic studies. The First stage shall be completed within the stipulated time as prescribed by the Council of Architecture.
- The Second stage of the course shall be of 2 academic years/ 4 semesters including 90 days (15-18 weeks) of practical training.
- A candidate will be eligible to register as an architect under the Architects Act, 1972 only after successful completion of both the stages.

Rule No.3: Scheme of Assessment

A candidate to be eligible for the degree of Bachelor of Architecture will be required to appear for and pass all examinations as under:

Stage I

- Semester I Examination in Architecture (First Year Sem I)
- Semester II Examination in Architecture (First Year Sem II)
- Semester III Examination in Architecture (Second Year Sem III)
- Semester IV Examination in Architecture (Second Year Sem IV)
- Semester V Examination in Architecture (Third Year Sem V)
- Semester VI Examination in Architecture (Third Year Sem VI)

Stage II

- Semester VII Examination in Architecture (Fourth Year Sem VII)
- Semester VIII Examination in Architecture (Fourth Year Sem VIII)
- Semester IX Examination in Architecture (Final Year Sem IX)
- Semester X Examination in Architecture (Final Year Sem X)

-

Rule No. 4: Granting of Academic Term

Each semester shall comprise of Eighteen weeks (Minimum 90 working days).

The candidate will be permitted to appear for semester examination only if he/she has,

- 75% attendance in each course that constitute a head of passing, prescribed by the university.
- Satisfactory completion of the 100% term work prescribed for each course.
- Satisfactory conduct as a bonafide student

The Principal/ Director of the institution shall have the right to withhold the student from appearing for examination of a specific course if the above requirements are not fulfilled.

Rule No. 5: Progression Requisite

As general rule a student shall be allowed to keep the next year of study of the course if he/she has a backlog of not more than “**Six heads of passing**” in the preceding year.

Furthermore,

- A student shall be allowed to get admitted to Second Year B. Arch. course if he/she has a backlog of not more than **six heads** of passing at First year B. Arch (semester I and II considered together).
- A student shall be allowed to get admitted to Third Year B. Arch course, if he/she has cleared all the subjects of passing at First year B.Arch and if he/she has a backlog of not more than **six heads** of passing at Second Year B.Arch (semester III and IV considered together).
- A student shall be allowed to get admitted to Fourth Year B.Arch course if he/she has cleared all the subjects of passing at Second Year B.Arch (Semester III and IV considered together.) and if he/she has a backlog of not more than **six heads** of passing at Third Year B.Arch (semester V and VI considered together)
- A student shall be allowed to get admitted to Final Year B.Arch course if he/she has cleared all the subjects of passing at Third Year B. Arch (Semester V and VI considered together), and if he/she has a backlog of not more than **six heads** of passing at fourth Year B.Arch (semester VII and VIII considered together)

Rule No 6: Examinations

6.1. Conduct of Examinations

The university examinations for all the 10 semesters shall be conducted at the end of each semester by the University.

6.2. Pattern of Examination: The evaluation scheme for B.Arch comprises of;

University Examination (UE)

Internal Assessment (IA)

6.2.1: ***University Examination***

UE will be conducted by the University and will be based on the entire syllabus. Assessment would be undertaken by internal examiner and external examiner jointly in equal weightage. Oral will be based on sessional work produced by the student covering entire syllabus.

The nature of assessment will vary depending upon the subject and its delivery and whether it is studio-based or theory based. Refer to detailed syllabus on the format of UE for individual subjects.

6.2.2: ***Internal Assessment***

IA will be conducted by the Institution imparting B.Arch course. IA will be done by the teacher teaching the course through a continuous assessment system that is spread through the duration of course. The attendance will have weight age of 10 marks and 25 marks for IA of 40 marks and 100 marks respectively. For remaining at least **two** and a maximum **four** of the below components can be used for continuous assessment.

Individual faculty member shall have the flexibility to design the continuous assessment in a manner so as to evaluate students' capabilities across knowledge, skills and attitudes. IA may be undertaken through any or combination of the methods stated below:

- Seminar presentation
- Written Test /Open Book
- Reviews
- Essays
- Short answer questions
- Study of best practices /precedent study/field study
- Multiple choice questions/Quiz
- Projects/group projects/Dissertation
- Reflective Practical assignments
- Drawing Portfolios
- Report writings
- Learning logs/diaries

The faculty shall announce in advance the units based on which continuous assessment shall be conducted. This progressive assessment for the IA must be communicated by the Institute to the university as per the schedule declared by the university. Detailed records of continuous

assessment shall be maintained by the Institute. The student does not have facility of grade improvement, if he/she passes at IA in a course.

6.3: Assessment of Term work

- In respect of term work “due date” shall be fixed for the completion of each assignment and the same shall be collected on the due date.
- At the end of the semester term work shall be assessed jointly by the internal and external examiners from amongst the panel approved by the University.
- Performance of a candidate in viva-voce shall be assessed on basis of the depth of understanding of the principles involved.
- Students may use computers for preparing term work where nature of work is unique to an individual and stress is on content rather than skill. For common form of work, drawing and reports/notes shall be manually prepared.
- An examiner for any of the subjects of examinations shall have a minimum of 3 years teaching/ professional experience in his/her field of study.

Rule No. 7: Credits

- The credits are defined in terms of the student-time spent in hours which are divided into two parts such as face to face instruction and Notional (lectures and studio).
- The total credits to be earned by the student to achieve B.Arch degree will be 300credits.

Semester	I	II	III	IV	V	VI	VII	VIII	IX	X
Credits	30	30	30	30	30	30	30	30	30	30

- Where, one credit is equal to 1hour of Lectures and 1 hour of Studio.
- Note: If a student secure D grade in either or both IA and UE for a particular course credits earned by the student for that courses shall be zero

Rule No.8: Criteria for Passing

To pass in every semester examination and earn the assigned credits, a candidate must obtain minimum 40% marks in each head of passing.

- a) For all courses, Both UE and IA constitute separate heads of passing. In order to pass in such courses and earn the assigned credits

The student must obtain minimum grade point of 5.0(40% marks) at UE and also minimum grade point of 5.0 (40%) marks at IA.

Or

If he/she fails in IA, the student passes in the course provided he/she obtains a minimum of 25% in IA and grade point average(GPA) for course is at least 6.0(50%in aggregate).the GPA for a course will be calculated only if student passes at UE.

- b) A student who fails at UE in a course has to reappear only at UE as a backlog candidate and clear the head of passing. Similarly, a student who fails in a course at IA has to reappear only at IA as a backlog and clear heads of passing.
- c) Students with backlog in IA will have to present themselves and their work for progressive marking throughout the semester for which they intend to appear.

Rule No.9: Grading system

9.1: Conversion of Marks to Grade points and Grades.

The marks shall be converted to grade points and grades as given in table below.

Range of marks (out of 100)	Grade Point	Grade
$80 \leq \text{Marks} \leq 100$	10	O
$70 \leq \text{Marks} < 80$	9	A+
$60 \leq \text{Marks} < 70$	8	A
$55 \leq \text{Marks} < 60$	7	B+
$50 \leq \text{Marks} < 55$	6	B
$40 \leq \text{Marks} < 50$	5	C
Marks < 40	0	D

9.2: Performance

The performance of a student will be evaluated in terms of two indices, viz

- a) Semester Grade Point average (SGPA) which is grade point average for all the semester
- b) Cumulative Grade point average (CGPA) which is the grade point average for all the completed semesters at any point.

9.3: Semester Grade point average (SGPA)

SGPA measures the cumulative performance of a learner in all courses in a particular semester. SGPA is calculated by the formula

$$SGPA = \frac{\sum C_k \times GP_k}{\sum C_k}$$

Where C_k is the credit-value assigned to a course and GP_k is a GPA obtained by the learner in the course.

The SGPA shall be calculated up to two decimal place accuracy.

9.4: Cumulative Grade point average (CGPA)

CGPA measures the cumulative performance of a learner in all courses since his/her enrolment. CGPA is calculated by the formula

$$CGPA = \frac{\sum C_k \times GP_K}{\sum C_k}$$

Where C_k is the credit-value assigned to a course and GP_K is a GPA obtained by the learner in the course.

The CGPA shall be calculated up to two decimal place accuracy.

The CGPA calculated after the minimum credits specified for the programme are earned will be the final result.

9.5: Award of Honours

A student who has completed the minimum credits specified for the programme shall be declared to have passed in the programme. The final result will be in terms of letter grade only and is based on the CGPA of all courses studied and passed. The criteria for the award of honours are as given in table below

Range of CGPA	Final Grade	Letter Grade
$9.50 \leq CGPA \leq 10.00$	O	Outstanding
$9.00 \leq CGPA \leq 9.49$	A+	Excellent
$8.00 \leq CGPA \leq 8.99$	A	Very Good
$7.00 \leq CGPA \leq 7.99$	B+	Good
$6.00 \leq CGPA \leq 6.99$	B	Average
$5.00 \leq CGPA \leq 5.99$	C	Satisfactory
CGPA Below 5.00	F	Fail

Rule No.10: Introduction of this Curriculum

The new curriculum for the degree course in architecture B.Arch will be introduced from Academic Session 2015 -2016

- First year B.Arch Course from June 2015
- Second year B.Arch Course from June 2016
- Third year B.Arch Course from June 2017
- Fourth year B.Arch Course from June 2018
- Final year B.Arch Course From June 2019

Rule No 11: Completion

Completion of only Stage-I, shall not qualify the candidates for registration as an architect. Degree of Bachelors in architecture shall be awarded only after successful completion of stage II.

Registration as an architect by council of architecture will only be given as per the prevailing rule of Council of Architecture, India.

Degree Requirements

Earned credits: A candidate who has successfully completed all the Core courses and elective courses, not less than minimum number of credits prescribed shall be eligible to receive the degree.

Rule No.12: Subject Code

Code used for serial numbers of the subjects in the structure for B.Arch course shall be as follows (from left, five digit/alphabet code)

- First alphabet for faculty of engineering-K
- Second digit for Board of Studies of architecture
- Third digit representing the year of the course in architecture
- Fourth and Fifth digits representing number of that subject in the course structure of that particular year

Structure and Contents
For
B.Arch 2015 CBCS course (Amended in 2018)

Bharati Vidyapeeth (Deemed to be University)
College of Architecture, Pune

Structure & Examination Pattern of First Year B.Arch

Semester-I								Total Duration-30hrs /week Total Credits-30			
Subject code	Subject	Teaching Scheme (in hours/week)			Examination Scheme (marks)			Credits			
		L	S	Total	I.A	U.E		Total	L	S	Total
						Paper	Oral				
K8101	Architectural Design-I	2	4	6	40	-	60	100	2	4	6
K8102	Building construction and Material-I	2	4	6	40	-	60	100	2	4	6
K8103	Theory of structures-I	3	-	3	40		60	100	3	-	3
K8104	Creativity and Communication-I	2	2	4	40	-	60	100	2	2	4
K8104	Architecture drawings and graphics-I	2	4	6	40	60	-	100	2	4	6
K8106	Workshop - Model making	1	4	5	100	-	-	100	1	4	5
	Total	12	18	30	300	60	240	600	12	18	30

Notations: L-Lectures, S-Studio

IA: Internal Assessment; UE: University Examination

Semester-II								Total Duration-30hrs/week Total Credits-30			
Subject code	Subject	Teaching Scheme (in hours/week)			Examination Scheme (marks)			Credits			
		L	S	Total	I.A	U.E		Total	L	S	Total
						Paper	Oral				
K8107	Architectural Design-II	2	4	6	40	-	60	100	2	4	6
K8108	Building construction and Material-II	2	3	5	40	-	60	100	2	3	5
K8109	Theory of structures-II	2	-	2	40	-	60	100	2	-	2
K8110	Creativity and Communication-II	1	3	4	40	-	60	100	1	3	4
K8111	Architecture drawings and graphics-II	1	4	5	40	60	-	100	1	4	5
K8112	History of Architecture -I	3	-	3	40	60	-	100	3	-	3
K8113	Climatology and Climate Responsive Architecture	1	2	3	40	-	60	100	1	2	3
K8114	Workshop - Model making and Building Appraisal	-	2	2	100	-	-	100	-	2	2
	Total	12	18	30	380	120	300	800	12	18	30

Structure & Examination Pattern of Second Year B.Arch

Semester-III								Total Duration-30hrs/week Total Credits-30			
Subject code	Subject	Teaching Scheme No.of hours			Examination Scheme No. of Marks				Credits		
		L	S	Total	I.A	U.E		Total	L	S	Total
		Paper		Oral							
K8201	Architectural Design -III	1	5	6	40	-	60	100	1	5	6
K8202	Building construction and Material-III	1	5	6	40	-	60	100	1	5	6
K8203	Theory of structures-III	2	-	2	40	-	60	100	2	-	2
K8204	Creativity and Communication-III	1	2	3	40	-	60	100	1	2	3
K8205	Architecture drawings and graphics-III	1	4	5	40	-	60	100	1	4	5
K8206	History of Architecture-II	3	-	3	40	60	-	100	3	-	3
K8207	Building Services -I	2	1	3	40	60	-	100	2	1	3
K8208	Elective-I	1	1	2	100	-	-	100	1	1	2
Total		14	16	30	380	120	300	800	14	16	30

Elective I :Traditional Building Science/Vernacular architecture and Settlements/Environmental studies/Photography, etc.

Notations: L-Lectures, S-Studio

IA: Internal Assessment; UE: University Examination

Semester-IV								Total Duration-30 hrs/week Total Credits-30			
Subject code	Subject	Teaching Scheme			Examination Scheme				Credits		
		L	S	Total	I.A	U.E		Total	L	S	Total
		Paper		Oral							
K8209	Architectural Design-IV	1	5	6	40	-	60	100	1	5	6
K8210	Building construction and Material-IV	1	5	6	40	-	60	100	1	5	6
K8211	Theory of structures-IV	2	-	2	40	-	60	100	2	-	2
K8212	Computer aided Design and Drawings	1	3	4	40	-	60	100	1	3	4
K8213	History of Architecture-III	3	-	3	40	60	-	100	3	-	3
K8214	Surveying and leveling	1	3	4	40	-	60	100	1	3	4
K8215	Building services-II	2	1	3	40	60	-	100	2	1	3
K8216	Elective-II	1	1	2	100	-	-	100	1	1	2
Total		14	16	30	380	120	300	800	14	16	30

Elective II:Seminar –I/Passive Design Principles/Animations/Communication Skills; etc.

Structure & Examination Pattern of Third Year B.Arch

Semester-V					Total Duration-30hrs/week Total Credits-30						
Subject code	Subject	Teaching Scheme			Examination Scheme				Credits		
		L	S	Total	I.A	U.E		Total	L	S	Total
		Paper	Oral								
K8301	Architectural Design-V	1	7	8	40	-	60	100	1	7	8
K8302	Building construction and Material-V	1	5	6	40	-	60	100	1	5	6
K8303	Theory of structures-V	2	-	2	40	-	60	100	2	-	2
K8304	Working drawing-I	1	4	5	40	-	60	100	1	4	5
K8305	History of Architecture-IV	3	-	3	40	-	60	100	3	-	3
K8306	Specification writing	2	-	2	40	60	-	100	2	-	2
K8307	Building services-III	2	-	2	40	60	-	100	2	-	2
K8308	Elective-III	1	1	2	100	-	-	100	1	1	2
Total		13	17	30	380	120	300	800	13	17	30

Elective III: Architecture Journalism/Appropriate Technology/Barrier-free Architecture/Seminar-II, etc.

Notations: L-Lectures, S-Studio

IA: Internal Assessment; UE: University Examination

Semester-VI					Total Duration-30hrs/week Total Credits-30						
Subject code	Subject	Teaching Scheme			Examination Scheme				Credits		
		L	S	Total	I.A	U.E		Total	L	S	Total
		Paper	Oral								
K8309	Architectural Design-VI	1	7	8	40	-	60	100	1	7	8
K8310	Building construction and Material-VI	1	5	6	40	-	60	100	1	5	6
K8311	Theory of structures-VI	2	-	2	40	-	60	100	2	-	2
K8312	Working drawing-II	1	3	4	40	-	60	100	1	3	4
K8313	Landscape Architecture	1	2	3	40	-	60	100	1	2	3
K8314	Estimation and Costing	2	1	3	40	60	-	100	2	1	3
K8315	Building services-IV	2	-	2	40	60	-	100	2	-	2
K8316	Elective-IV	1	1	2	100	-	-	100	1	1	2
Total		13	17	30	380	120	300	800	13	17	30

Elective IV: Green Materials/Theatre and set design/Visual Communication/Advanced Building Material, etc

Structure & Examination Pattern of Fourth Year B.Arch

Semester-VII								Total Duration- 30hrs/week Total Credits-30			
Subject code	Subject	Teaching Scheme			Examination Scheme			Credits			
		L	S	Total	I.A	U.E		Total	L	S	Total
						Pap er	Oral				
K8401	Architectural Design-VII	1	9	10	40	-	60	100	1	9	10
K8402	Building construction and Material-VII	1	3	4	40	60	-	100	1	3	4
K8403	Theory of structures-VII	2	-	2	40	-	60	100	2	-	2
K8404	Interior Design I	1	3	4	40	-	60	100	1	3	4
K8405	Advance Landscape Architecture	1	2	3	40	-	60	100	1	2	3
K8406	Urban planning I	1	2	3	40	60	-	100	1	2	3
K8407	Building services-V	2	-	2	40	-	60	100	2	-	2
K8408	Elective-V	1	1	2	100	-	-	100	1	1	2
	Total	10	20	30	380	-	420	800	10	20	30

Elective V :Sustainable Architecture/Industrial architecture/Disaster management/Housings, etc

Notations: L-Lectures, S-Studio

IA: Internal Assessment; UE: University Examination

Semester-VIII								Total Duration- 30hrs/week Total Credits-30			
Subject code	Subject	Teaching Scheme			Examination Scheme			Credits			
		L	S	Total	I.A	U.E		Total	L	S	Total
						Pap er	Oral				
K8409	Architectural Design-VIII	1	9	10	40	-	60	100	1	9	10
K8410	Building construction and Material-VIII	1	3	4	40	60	-	100	1	3	4
K8411	Vocabulary and Repertoire	1	2	3	40	-	60	100	1	2	3
K8412	Interior Design -II	1	3	4	40	-	60	100	1	3	4
K8413	Urban planning- II	1	2	3	40	60	-	100	1	2	3
K8414	Research Skills	1	3	4	40	-	60	100	1	3	4
K8415	Elective-VI	1	1	2	100	-	-	100	1	1	2
	Total	10	20	30	340	-	360	700	07	23	30

Elective VI : Conservation /Digital Architecture /Architectural software/ Real Estate Management , etc

Structure & Examination Pattern of Fifth Year B.Arch

Semester-IX: Practical Training								Total Credits-30			
Subject code	Subject	Teaching Scheme			Examination Scheme **			Credits			
		L	S	Total	I.A	U.E		Total	L	S	Total
K8501	Practical Training					Paper	Oral		100		
					40		60				
		-	-	-					-	-	30

Notations: L-Lectures, S-Studio

IA: Internal Assessment; UE: University Examination

Note 1: For practical training, a student is expected to work for standard office timings i.e. @ 8 hours a day and minimum five days per week. Student has to undergo minimum 15 -18 weeks (90 work days) of training per semester. The credit requirement for practical training as per circular No.265, pt.II.8 is 24. Since a student will spend the entire semester learning at an office as an intern he/she will be given the 30 credits which are consistent with the 30 credits that are allotted to all other semesters.

Note 2: The work from practical training will be assessed after the student completes the internship in this semester.

Note 3: Validity of training shall be only for a year after completion of training.

Semester-X								Total Duration-30hrs/week				Total Credits-30			
Subject code	Subject	Teaching Scheme			Examination Scheme				Credits						
		L	S	Total	I.A	U.E		Total	L	S	Total				
K8502	Architecture Design Project	2	14	16	40		Paper		Oral	100	2	14	16		
						-		60							
K8503	Capstone project	1	5	6	40	-	60		100	1	5	6			
K8504	Professional Practice	2	2	4	40	60	-		100	2	2	4			
K8505	Self Study	1	3	4	100	-	-		100	1	3	4			
	Total	06	24	30	220	60	120	400	06	24	30				

Semester – I

Architectural Design -I

Subject Code	K8101	Semester -I
Credits	6	Subject type-Core

Learning Objectives	
1	To acquire knowledge about elements of design and principles of design.
2	To explore and understand fundamentals of design central to architecture and space design.
3	To understand design as a composite process of elements, principles and fundamentals of design.

A. Learning Outcomes: Student will be able to	
1	explore elements of design, principles of design and fundamentals of design
2	assimilate the above three to understand comprehensive design process
3	learn and analyze built and/or non-built spaces with respect to above elements

Units	Contents
Unit I	Elements, Principles and Fundamentals of Design Introduction to <ul style="list-style-type: none"> - different Elements of design, - Principles of design and - Fundamentals of Design
Unit II	Design Process: Function <ul style="list-style-type: none"> - Introduction to ‘human dimensions’ (anthropometry, modes of measurement) - Introduction to function and circulation of various building types - Demonstration the relationship of the above two with elements and principals of design (form, organization, movement, openings, linkages, etc)
Unit III	Design Process: Structure <ul style="list-style-type: none"> - Introduction to different structural systems - Introduction to components of structure - Introduction to structural behavior of different materials
Unit IV	Design Process : Context <ul style="list-style-type: none"> - Introduction to buildings and climate - Introduction to building and site - Introduction to building and orientation - Analyze and demonstrate relationship of context with elements and principles of design

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. ChingF. D. K. (2007), <i>Architecture: form, space, and order</i>, New Jersey, Canada, John Wiley and sons. 2. Pramara V. S.(1997),<i>Design Fundamentals in Architecture</i>,New York, U.S.A., Somaiya Publications
Reference Books:	<ol style="list-style-type: none"> 1. Editors of Phaidon Press (2004), <i>ThePhaidon Atlas of Contemporary World Architecture</i>, Phaidon Press; Comprehensive Edition. 2. Pandya Y., VastuShilpa Foundation, (2013),<i>Elements of space making</i>, India, New Jersey, Mapin Publishing. 3. Salvadori M., & Robert H., (1975),<i>Structure in architecture: the building of</i>

	<i>buildings</i> , Cornell University, Prentice-Hall. 4. Gropius W., (1962), <i>Scope of Total Architecture</i> , New York, Collier book
Websites:	Drawing Guidelines – Shaping Space http://www.riai.ie/downloads/education/pdf/ss_guidelines/drawing_guidelines.pdf
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment (Any 3)	
1	Analysis and study of design principles and elements using different kinds of examples of built and/or non-built spaces with help of sketches, photographs, drawings etc.
2	Study of structural systems, components of structures in built spaces.
3	Analysis of relationship between building and climate, building and site and orientation with the help of built and/or non-built environment with the help of sketches, photographs, drawings, etc.
4	Photo documentation and study of use of materials for various design components and design considerations.

Building Construction and Materials-I

Subject Code	K8102	Semester-I
Credits	6	Subject type-Core

Learning Objectives	
1	To understand the properties, characteristics, strength, processing and application of materials
2	To understand the different components of masonry construction

Learning outcomes: Student will be able to	
1	Explore materials, properties characteristics, methods of preservation, treatment and methods of construction and uses of different materials
2	Describe in detail the method of construction of superstructure with various masonry
3	Discuss different material used for fencing as well as for gates.
Units	Contents
Unit I	Introduction <ul style="list-style-type: none"> - Building construction as subject and its relevance to architectural design. - Introduction to various components of building from foundation to roof. - Basic structural systems load bearing and framed structure
Unit II	Study of Materials Properties, various types, market form available, standard sizes, cost, application in buildings resource use, defects and strengths of each material <ul style="list-style-type: none"> - Bricks and stones - Cement, Sand , aggregates - Mortar, Plaster, Pointing - Lime
Unit III	Superstructure Masonry <ul style="list-style-type: none"> - Fundamentals, principal of load bearing construction for medium rise structures using Brick, stone, Concrete Blocks, solid Blocks, Hollow Blocks, Cavity Block etc. - Introduction to various types and junctions of brick bond and types of stone masonry
Unit IV	Fencing And Entrance Gate <ul style="list-style-type: none"> - Fencing and compound wall construction in different materials like Barbed wire, Chain link, Wire mesh, R.C.C. Grills, M.S. Grills etc. - Constructional details of an entrance gate in a compound wall of following types: Sliding Gate, Entrance gate side hung with floor channel, Entrance gate side hung with wicket gate

Learning Resources	
Text Books:	1. Rangwala S. C.(2007) <i>Engineering Materials</i> . Gujarat, Charotar, Publishing House. 2. Duggal S.K.(2009) <i>Building materials</i> . New Delhi, New Age International.
Reference Books:	1. Varghese P.C.(2005) <i>Building Materials</i> . New Delhi, Prentice Hall of India put Ltd. 2. Duggal S.K.(1997) <i>Building materials</i> . New Delhi, Oxford and IBH

	publishing Co, put, Ltd 3. Spencke R. F.and Cook D.J.(1983) <i>Building Materials in Developing Countries</i> . New York,John Wiley and sons
Websites:	www.shannonmasonryconstruction.com
Journals:	Construction and building materials -journal- else vier (www.journals.elsevier.com/construction-and-building-materials/) Journal of building construction and planning research (www.scirp.org/journal/jbcpr/)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation.(Min.4drgs.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different designs in masonry construction and fencing designs for prescribed projects.(Under discretion of the subject faculty)

Theory of Structure -I

Subject Code	K8103	Semester-I
Credits	3	Subject type-Core

Learning Objectives	
1	To understand basic structural concepts
2	To understand behavior of different materials
3	To understand fundamentals of structure

Learning Outcomes: student will be able to	
1	Develop understanding of basic requirements of stability, strength of materials
2	Develop understanding of behaviour of basic structural elements
3	Understand importance of basic structural elements in structural systems.

Units	Contents
Unit I	Introduction Introduction to basic structural elements like column/post, beam, slab, load bearing walls. The load transfer mechanism. Introduction to dead load and live load. Simple calculation of dead load of one way slab and beam if their dimensions are known, in order to know how much load is transferred from each element
Unit II	Supports <ul style="list-style-type: none"> - Types Of Supports And Load Transfer To The Supporting Element : Explain beams as a system in equilibrium and explain conditions of equilibrium (Σf_x, Σf_y and $\Sigma m = 0$) - Types of supports: roller hinged and fixed supports. Explain in which practical connection we idealize it as hinge/ roller/ fixed. (theory only) - Type of beams: simply supported, cantilever and overhanged beam. Calculating the reaction they transfer to the support. (calculation should include udl and point load standard cases - UDL over entire span - Point load at centre and eccentric - UDL near one support - Shear force and Bending Moment and its importance
Unit III	Properties Of Section <ul style="list-style-type: none"> - Centre of gravity – its importance - How to find CG of standard T, Channel, I, angle section and combination of such sections
Unit IV	Moment of Inertia <ul style="list-style-type: none"> - Moment of inertia – its importance - MI formulae of standard sections. Calculations for rectangle and circle, T, Channel, angle and I section using parallel axis theorem. - Section modulus and radius of gyration – definition.

Learning Resources	
Text Books:	1. Mario Salvadori.(1980). <i>Why buildings stand up:The strength of architecture</i> .McGraw-Hill 2. Dongre A.P.(2011). <i>Strength of</i>

	<i>Materials</i> .Pune/Hyderabad,ScitechPublications
	3. Deo S.S.(2013). <i>Engineering Mechanics</i> .Pune,NiraliPrakashan 4. Deo S.S.(2013). <i>Strength of Materials</i> .Pune,NiraliPrakashan 5. S B Junnarkar& Dr. H J Shah,(2012). <i>Mechanics of Structures Vol. I & II</i> .Anand,CharotarPublishing
Reference Books:	1. Beer and Johnston,(2008). <i>Mechanics of Materials</i> .New Delhi,Tata McGraw-Hill 2. Khurmi R.S.(2014). <i>Strength of Materials</i> .New Delhi,S.Chand& Company Ltd 3. Nash W.A.(1994)International edition <i>Strength of materials - III rd edition, (theory and problems)</i> .Singapore,McGraw-Hill book co. 4. Timoshenko Stephen.(2002). <i>Strength of materials part I &II(elementary theory and problems) IIIrd ed</i> .New Delhi,CBS Publishers
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Calculate the load transferred on the supporting beam/ column for simply supported cantilever and overhang beam. (find reactions)
2	Study of various cross sections such T, C,L, I and O as various structural elements. Calculations of T,C, L ,I and o sections
3	Photo Documentation : various type of beams, various type of supports, various types of loads, various types of cross sections
4	Making models : various type of beams, various type of supports, various types of loads, various types of cross sections

Creativity & Communication -I

Subject Code	K8104	Semester -I
Credits	4	Subject type-Core

Learning Objectives	
1	To understand elements of design and principles of design as a basic creative activity.
2	To study/analyze principles of organizations.
3	To develop artistic and architectural vocabulary for effective verbal and written communication.
4	To appreciate visual art forms like sculpture, paintings, calligraphy, caricatures etc.

Learning Outcomes: Student will be able to	
1	Explore basic elements of design and their expressions artistically
2	Explore principles of design and their expressions artistically
3	Understand and explore principles of organizations
4	Understand and develop artistic and architectural vocabulary

Units	Contents
Unit I	Elements of Design <ul style="list-style-type: none"> - Introduction to Elements of design - Interpretation of points, lines and planes - Expressions through colors, textures and light
Unit II	Principles of Design <ul style="list-style-type: none"> - Introduction to Principles of Design - Theory on Lateral Thinking and exercise on generation of alternatives - Explorations of Principles of Design through 2D compositions
Unit III	Organization <ul style="list-style-type: none"> - Introduction to Organization - Explorations of Organization through 3D compositions
Unit IV	<ul style="list-style-type: none"> - Introduction to Visual arts (painting, sculpture, calligraphy etc.) - Understanding attributes of elements of visual and architectural aesthetics - Visual Arts appraisal
Unit V	Verbal and Written Communication <ul style="list-style-type: none"> - Exploration of different ways of verbal and written communication

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i>, New Jersey, John Willy and Sons 2. Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i>, New Jersey, John Willy and Sons
Reference Books:	<ol style="list-style-type: none"> 1. Yatin Pandya (2014) <i>Elements of Space Making</i>, Ahmedabad, Mapin Publishing 2. Shirish Vasant Bapat (1993) <i>Basic Design and Anthropometry</i>, Pune, Bela Books 3. Barry A Berkus (2000) <i>Architecture, Art – Parallels and Connections</i>, Australia, Watson-Guptill Publications 4. Bacon E.N. (1974) <i>Design of Cities</i>, England, Penguin Books

	<p>5. Akiko Busch (1991) <i>The Art of Architectural Models</i>, Hong Kong, Design Press</p> <p>6. Nick Bunn (2010) <i>Architectural Model Making</i>, London, Laurence King Publishing</p> <p>7. Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i>, United Kingdom, Acropolis Books</p> <p>8. Thompson I (1999) <i>Frank Lloyd Wright: A Visual Encyclopedia</i>, London, Grange Book Plc</p> <p>9. Edward De Bono (1990) <i>Lateral Thinking</i>, London, Penguin Books</p>
Websites:	<p>www.artinarch.org</p> <p>www.edwdebono.com</p>
Journals	

Assessment		Marks
IA	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
UE	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
Drawing portfolio consisting of relevant exercises including	
1	Self Portrait
2	Exercise on inter-relation of emotions and their expressions though lines and colors – in the form on thumb sketches or series of expressions explaining a story line OR creating a graphic strip explain a story OR creating a graphical story board for a concept
3	Exploration of textures in form of 3D models
4	Analysis of effects of different lighting conditions in architecture
5	Exploration of different generations of alternatives through modules
6	Exploration of Principles of Design based on 2D compositions of modules
7	Exploration of Vertical and Horizontal Planes based on modules to understand anthropometry
8	Exploration of Organization through 3D composition with solids like cubes, cuboids, pyramids, cones, cylinders, spheres etc.
9	Group work on Appreciation of Visual Arts
10	Exercise on verbal and written communication in the form of compilation of an architect's works and seminar presentation of the same or newspaper article etc.

Architectural Drawings and Graphics-I

Subject Code	K8105	Semester -I
Credits	6	Subject type-Core

Learning Objectives	
1	To understand visualization principles of various objects related to architecture.
2	To enable students to present in graphical form all building elements and free hand sketching.

Learning Outcomes: student will be able to	
1	Develop skills in free hand sketching
2	Represent different forms, building elements and materials
3	Visualize and represent in Two-Dimension And Three-Dimension Graphic communication

Units	Contents
Unit I	Basic skills of drafting <ul style="list-style-type: none"> - Lettering: Freehand architectural lettering. - Lines: Concept and types of lines, Dimension lines. - Drafting convention. - Study of Scales.
Unit II	Geometry <ul style="list-style-type: none"> - Geometrical constructions
Unit III	Represent 3D objects in 2 D <ul style="list-style-type: none"> - Definition, Meaning & concept. - Projection of points, lines, planes and solids through orthographic projections to understand 2D building representation. Sections <ul style="list-style-type: none"> - To represent the building through sections
Unit IV	Three dimensional representation <ul style="list-style-type: none"> - Existing building views through sketching

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. F. D K. Ching (2009) <i>Architectural Graphics</i>, New Jersey, John and Wiley and Sons 2. Hugh C. Browing (1996) <i>The Principles of Architectural Drafting</i>, New York, Watson-Guptill Publications 3. N.D.Bhatt (2012) <i>Engineering Drawing</i>, Gujrat, Charator Publishing House. 4. Rangwala(1991)<i>Civil Engineering Drawing</i>, Gujarat, Charator Publishing House
Reference Books:	<ol style="list-style-type: none"> 1. Calvin F. Schmid, Stanton E. Schmid, (1954) <i>Handbook on Graphic Presentation</i>, New York, The Ronald Press Company 2. David Littlefield (2012) <i>Matric Handbook</i>, London and New York, Routledge Taylor and Francis Group. 3. Sleeper R.(2000)<i>Architectural Graphic Standards</i>, New York, John Wiely and Sons.
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
UE	University Examination	60
	Theory paper of 03 hours	

Workshop –Model Making

Subject Code	K8106	Semester -I
Credits	5	Subject type-Core

Learning Objectives	
1	To equip students with the basic skills necessary to represent their ideas in a model format using simple materials like paper, thermocol, hardwood, Metals, glass fiber etc.
2	To familiarize students with cutting, drilling, grinding, slotting, shaping, bending and measuring instruments, filing, scraping and fitting etc.; processes used in making models.

Learning Outcomes: student will be able to	
1	Develop skills in making 2D and 3Dmodels.
2	Apply carpentry instruments and their uses.
3	Understand the importance of model making as a tool to represent ideas and visualize objects/ elements/structures in architecture.

Units	Contents
Unit I	Introduction to types of model - Block models, detailed model, Construction Model and interior, Models etc.
Unit II	Introduction to various materials - Experimentation with these materials for different geometries and scales of models
Unit III	Tools in model making - Development of the skill to use the tools with precision to obtain desired results in model making.
Unit IV	Exploration of Building materials - Hands on approach

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Akiko Busch (1991) <i>The Art of Architectural Models</i>, Hong Kong, Design Press 2. Nick Bunn (2010) <i>Architectural Model Making</i>, London, Laurence KingPublishing. 3. Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i>, United Kingdom, Acropolis Books 4. Alexander Schilling, (2008)<i>Basics Model Building</i>, BostenBerlin,Birkhauser publishers for Architecture
Reference Books:	<ol style="list-style-type: none"> 1. ShirishVasantBapat (1993) <i>Basic Design and Anthropometry</i>, Pune, Bela Books. 2. Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i>, New Jersey, John Willy and Sons. 3. Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i>, New Jersey, John Willy and Son
Websites:	www.artinarch.org
Journals:	

Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Assignments	
1	Model making-design projects.
2	Model-Construction details.
3	Model -Creative Arts and crafts

Semester – II

Architectural Design -II

Subject Code	K8107	Semester -II
Credits	6	Subject type-Core

Learning Objectives	
1	To develop communication and representation skills
2	To document spaces in graphic form
3	To explore concepts of space design with a focus on function and anthropometry

Learning Outcomes: Student will be able to	
1	Develop skills to understand and represent design ideas through graphic communication.
2	Learn to measure, document and represent spaces.
3	Understand and demonstrate a simple design responding to functional requirements and appropriate scale.

Units	Contents
Unit I	Measured Drawing - Introduction and demonstration of modes of measurements and methods of documentation of built and/or non built spaces - Introduction and demonstration of different methods of representation
Unit II	Analysis - Study of function, circulation, scale and modes of measurement with respect to a specific activity.
Unit III	Design Demonstration - Design of single activity spaces reflecting understanding of the above.

Learning Resources	
Text Books:	
Reference Books:	1. Batley C., (1948), <i>The design development of Indian architecture</i> , J. Tiranti, ltd. 2. Ching F. D. K. (2007), <i>Architecture: form, space, and order</i> , New Jersey, Canada, John Wiley and sons. 3. Editors of Phaidon Press (2004), <i>The Phaidon Atlas of Contemporary World Architecture</i> , Phaidon Press; Comprehensive Edition. 4. Pandya Y., VastuShilpa Foundation, (2013), <i>Elements of space making</i> , India, New Jersey, Mapin Publishing. 5. Thakkar J., & Morrison S., (2008) <i>Matra, Ways of Measuring Vernacular Built Forms of Himachal Pradesh</i> , Ahmedabad, India, SID Research Cell 6. Radford W. A., (1921), <i>Architectural Details and Measured Drawings of Houses of the Twenties</i> , Courier Corporation. 7. Chitham R, (1980), <i>Measured Drawing for Architects</i> , originally from the University of Michigan, Architectural Press.
Websites:	Drawing Guidelines – Shaping Space http://www.riai.ie/downloads/education/pdf/ss_guidelines/drawing_guidelines.pdf Pandya Y. & Tiwari. S., (nd), <i>An Ethnographic and Collaborative Model of Inquiry: Activity Centre Project in India</i> , Chapter 2, from http://www.springer.com/978-981-4585-10-1
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Measured drawing of any structure relevant to the topic - Drawing Portfolio
2	Design of single activity unit with a demand of knowledge of function, circulation and anthropometry (e.g. Canteen, bus-stop, play school, library, clinic, boutique, etc.) – Drawing portfolio. Models to understand and explain the Designed Spaces.
3	Photo documentation and analysis of related / similar designed spaces.

Building Construction and Materials-II

Subject Code	K8108	Semester -I
Credits	5	Subject type-Core

Learning Objectives	
1	To involve students in a number of drawing exercises that will analyze the various building components in a simple load bearing structure.
2	To inform properties and characteristics of timber, its conversion, preservation and uses
3	To make students aware of various market forms of timber, their production, properties and application in the building industry

Learning Outcomes: Student will be able to	
1	Understand the different construction practices adapted for the various components of doors and windows to specific material in which it's made.
2	Understand the concept of opening and its construction techniques

Units	Contents
Unit I	Door, Windows and Openings <ul style="list-style-type: none"> - Introduction to various hardware used for doors, window - Terminology and construction aspects of door ,windowand opening
Unit II	Spanning Of Opening <ul style="list-style-type: none"> - lintel and arch construction - Terminology of arch construction and load transfer - Construction and formwork for lintel and arch - Spanning of opening using brick and stone for various types of arches like flat, segmental, semi circular etc. - Spanning of opening using brick, stone, timber, built-up sections for lintel construction
Unit III	Doors <ul style="list-style-type: none"> - Design considerations, single and double shutters, party glazed and partly paneled shutters - Glazed, Paneled and Flush doors in wood. Types of Flush doors. - Ledged, braced and battened and framed door. (Introduction) - Sliding and sliding- folding door in T.W. and Aluminum. - Steel Door Construction - Pressed sheet shutter - Box section frame and paneled shutter - Rolling shutter - Collapsible gates - Safety or Grilled doors
Unit IV	Windows <ul style="list-style-type: none"> - Underline principles for appropriate selection and application of different type of wooden windows & steel windows. - Paneled, fixed and partly and fully glazed and louvered, centrally pivoted, top hung windows, Side hung windows in wood. - Bay windows in wood - Steel window using 'Z' section - Steel window using Box section & of proprietary nature

Unit V	Study of Materials <ul style="list-style-type: none"> - Timber and Bamboo - Various timber joints - Hollow concrete block - Reinforced Brick work
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Learning Resources	
Text Books:	1. Rangwala S. C.(2007) <i>Engineering Materials</i> . Gujarat,Charotar, Publishing House. 2. Duggal S.K.(2009) <i>Building materials</i> . New Delhi, New Age International.
Reference Books:	1. Don A. Watson, (1972) <i>Construction Materials and Processes</i> , New York, McGraw Hill. 2. WB Mackey, (1981) <i>Building construction, Vol 1,2</i> .UK, Longman UK. 3. Francisa D.K. Ching(2000) <i>Building Construction Illustrated</i> .NewYork,John Wiley & Sons.
Websites:	http://www.slideshare.net/parteeeks9/doors-windows-12082151 (doors n windows)
Journals:	The open construction and Building Technology journal (benthamopen.com/tobctj/home)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination Assignments or portfolios based on entire syllabus as mentioned below.	60

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation.(min.4 drawings.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different designs in door and window construction and opening designs for prescribed projects (Under discretion of the subject faculty).

Theory of Structures-II

Subject Code	K8109	Semester -II
Credits	2	Subject type-Core

Learning Objectives	
1	To understand forces acting on members
2	To understand properties and behaviour of different materials
3	To understand shear and bending stresses

B. Learning Outcomes: Student will be able to	
1	Develop understanding of stresses and strains on members.
2	Develop understanding of properties of basic structural materials.
3	Understand importance of consideration of shear forces.

Units	Contents
Unit I	Stress and Strain - What is stress (axial, bending and shear), strain. - Calculation of axial stress, strain for composite material like RCC.
Unit II	Bending Stress - Calculation of bending stress using formulae for standard sections. T,C, L and I - What is combination of axial and bending stress,for a masonry column and base of retaining wall for stability.
Unit III	Shear Stress Calculation - Calculation of shear stress using formulae for standard sections. T, C, L and I.
Unit IV	Elastic constants and stresses - Structural properties: Elasticity, maximum Permissible Tensile/compressive stress, bending stress and shear stress for various materials like timber, masonry, concrete and steel. Explain the difference between behaviour of a ductile material like steel and brittle material like concrete subjected to tensile force. (stress-strain curve and Hooke's law).

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Khurmi R.S.(2014)<i>Strength of Materials</i>. New Delhi, S.Chand& Company Ltd. 2. Nash W.A.(1994)International edition <i>Strength of materials - III rd edition, (theory and problems)</i>.Singapore, McGraw-Hill book company. 3. Timoshenko Stephen.(2002)<i>Strength of materials part I. (elementary theory and problems) IIIrd ed</i>. New Delhi, CBS Publishers..Timoshenko Stephen.(2002)<i>Strength of materials part II (elementary theory and problems) IIIrded</i>.NewDelhi,CBS Publishers. 4. Bansal R. K.(2014) <i>A text book of strength of materials</i>. 5. Singhal S.B.&Narayan.R. <i>Materials and structures (vol-I) Strength of materials</i>. New Delhi, R.Chand& Company Ltd. 6. Warnock F.V. <i>Strength of Materials with ED</i>. London, Sir Isaac Pitman & Sons.Ltd.

	7. RamamruthamS.Narayan.R. (2009) <i>Theory of Structures</i> . New Delhi, Dhanpatrai Publications P.Ltd. 8. RamamruthamS.Narayan.R.(2014) <i>Theory of Structures (for Engineering Degree ,Diploma)</i> .New Delhi, Dhanpatrai Publications P.Ltd.
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Numerical problems on calculation of axial stress and strain in composite elements.
2	Numerical problems on calculation of bending stress in beams and columns.
3	Numerical problems on calculation of combined stresses
	Photo Documentation: structural damages due to excessive stresses, identifying the reasons of damages.

Creativity & Communication-II

Subject Code	K8110	Semester -II
Credits	4	Subject type-Core

Learning Objectives	
1	To understand volume and form.
2	To study/analyze scale and proportions
3	To appreciate performing art forms like films, theatre, dance etc

Learning Outcomes: student will be able to	
1	Explore volume and form as basic elements of design
2	Understand scale and proportion and their impact on spaces
3	Appreciate performing arts

Units	Contents
Unit I	Volume and Form - Introduction to Attributes of Form and Space - Understanding derivatives of form - Volumetric Study of Spaces – positive and negative spaces
Unit II	Scale and Proportion - Theory on Scale and Proportion - Exploration of Scale and Proportion through 2D and 3D mediums
Unit III	Performing Arts Appraisal - Introduction to Performing arts (films, theatre, dance etc.) - Understanding attribute of elements of performing arts
Unit IV	Communication through performing art Exploration of different ways of communication through performing art

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i>, New Jersey, John Willy and Sons 2. Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i>, New Jersey, John Willy and Sons 3. Yatin Pandya (2014) <i>Elements of Space Making</i>, Ahmedabad, Mapin Publishing 4. ShirishVasantBapat (1993) <i>Basic Design and Anthropometry</i>, Pune, Bela Books 5. Barry A Berkus (2000) <i>Architecture, Art – Parallels and Connections</i>, Australia, Watson-Guptill Publications 6. Bacon E.N. (1974) <i>Design of Cities</i>, England, Penguin Books 7. Akiko Busch (1991) <i>The Art of Architectural Models</i>, Hong Kong, Design Press 8. Nick Bunn (2010) <i>Architectural Model Making</i>, London, Laurence King Publishing 9. Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i>, United Kingdom, Acropolis Books 10. Thompson I (1999) <i>Frank Lloyd Wright: A Visual Encyclopedia</i>,

	London, Grange Book Plc 11. Edward De Bono (1990) <i>Lateral Thinking</i> , London, Penguin Books
Websites:	www.artinarch.org www.edwdebono.com
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
Drawing portfolio consisting of relevant exercises including	
1	Understanding Volume as an element of design and exploration of positive and negative spaces in a volume or 3D composition
2	Exercise on exploration of derivatives of form
3	Understanding theory of scale and proportions and representing the same through study of anthropometry of spaces
4	Group work on Documentary/ Film as Performing Arts appraisal

Architectural Drawings and Graphics-II

Subject Code	K8111	Semester -II
Credits	5	Subject type-Core

Learning Objectives	
1	To develop perception and presentation of different forms and their spatial dimension.
2	To develop rendering techniques and presentation skill

Learning Outcomes: Student will be able to	
1	Visualize three Dimensional representations of complex objects and to relate the graphics content with Architectural Design.
2	Explore Rendering technique skills with various media, incorporating sciography and creating three-dimensional effects.

Units	Contents
Unit I	Three dimensional representation - Isometric, axonometric and oblique view of solid composition and building.
Unit II	Interpenetration of solids - Interpenetration of various solids and its relation in building design.
Unit III	Presentation of drawings - Rendering technique with various media.
Unit IV	Sciography - Introduction of sciography. - Representation of Shade and shadows in plans and elevations.

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Calvin F. Schmid, Stanton E. Schmid, (1954) <i>Handbook on Graphic Presentation</i>, New York, The Ronald Press Company 2. F. D K. Ching (2009) <i>Architectural Graphics</i>, New Jersey, John and Wiley and Sons. 3. Francis DK Ching (1989) <i>Drawing A Creative Process</i>, Van Nostrad Reinhold 4. Hugh C. Browing (1996) <i>The Principles of Architectural Drafting</i>, New York, Watson-Guptill Publications. 5. .N.D.Bhatt(2012) <i>Engineering Drawing</i>, Gujarat, Charator Publishing House
Reference Books:	<ol style="list-style-type: none"> 1. Calvin F. Schmid, Stanton E. Schmid, (1954) <i>Handbook on Graphic Presentation</i>, New York, The Ronald Press Company 2. David littlefield (2012) <i>Matric Handbook</i>, London and New York, RoutledgeTaylor and Francis Group.
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper of 03 hours	60

History of Architecture-I

Subject Code	K8112	Semester -II
Credits	3	Subject type-Core

Learning Objectives	
1	To understand development of architecture as a process of contextual and cultural evolution rather than simply as a product.
2	To acknowledge and interpret from history, best design guidelines which respond aptly to the vernacular character of that place, the lifestyle of the users and building traditions of that time.
3	To gain knowledge of the development of architectural form with reference to Technology, style and character.

Learning Outcomes: Student will be able to	
1	Discuss Geography, Politics, Economy, Social Systems, Religion, Paintings and Sculptures and its influence on Architecture at different periods of time.
2	Explore cultures and civilizations and settlements across the world

Units	Contents
Unit I	Pre-historic <ul style="list-style-type: none"> - Housing forms in the initial phase: Cave shelters- at Lascaux, Terra Amata - Community structures: Menhir, dolmen, gallery and passage graves, Stonehenge, Ggantija Malta
Unit II	River Valley Civilizations <ul style="list-style-type: none"> - Yellow River - Indus River - Nile River - Tigris River
Unit III	Vedic Architecture <ul style="list-style-type: none"> - Vedic culture and town planning layouts, Vedic Village, City Planning in later Vedic period, Building materials and construction techniques. Buddhist Phase <ul style="list-style-type: none"> - Major typologies – Stambha, Stupa, Chaitya, Vihara. - Development of Chaitya arch - Lomas Rishi, AshokanStambhas, The Great Stupa at Sanchi, Chaitya Hall at Karli, Viharas at Ajanta
Unit IV	Greek Civilization <ul style="list-style-type: none"> - History, evolution and characteristics Elements of special attributes: Classical Orders, Optical corrections – Acropolis, City of Athens - Major typologies - Temples, Theatres, Agora, Stoa, Council Halls
Unit V	Roman Civilization <ul style="list-style-type: none"> - History, evolution and characteristics Elements of special attributes: - Arches, lintels, bridges, aqueducts, Roman engineering skills - Major typologies - Temples- Pantheon, Basilica at Trajan, Amphitheatre, Hippodrome, Circus, Palaces, Thermae at Carcalla

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Sir Banister Fletcher, (1999) <i>A History of Architecture, Indian Edition</i>. Delhi, CBS Publications. 2. Spiro Kostof, (1985) <i>A History of Architecture: Setting and Ritual</i>. London, Oxford University Press. 3. Leland M Roth, (1994) <i>Understanding Architecture: Its Elements, History and Meaning</i>. Craftsman House; 4. Pier Luigi Nervi, General Editor, (1972) <i>History of World Architecture – Series</i>. New York, Harry N. Abrams Inc. Pub. 5. Burns, Ralph, Lerner, Meacham, (1991) <i>World Civilizations</i>. First Indian Edition, Delhi, Goyal Saab Publishers and Distributors. 6. Roger Smith, (1987) <i>An Illustrated history of Architectural Styles</i>. 7. Omega Books Ltd. 8. Sebastiano Serlio, (1982) <i>The five books on architecture</i>. New York, Dover Publication Inc. 9. Percy Brown, (1983) <i>Indian Architecture (Hindu And Buddhist)</i>. Bombay, Taraporevala and Sons. 10. Denis Montagnon, (2001) <i>Rome</i>. ISBN 3-8228-5870-6. Germany, TashchenGmbH 11. Satish Grover, (2003) <i>The Architecture of India (Buddhist and Hindu Period)</i>. New Delhi, Vikas Publishing Housing Pvt. Ltd.
Websites:	<p>www.ancient.eu/Roman_Architecture/ www.slideshare.net/mfresnillo/roman-architecture-398210 www.slideshare.net/mfresnillo/greek-architecture architecture.pppst.com/greek.htm msroseclass.weebly.com/uploads/2/5/9/.../ms_rose_greek_architecture.pp. http://www.slideshare.net/kabithamadhu/vedic-age</p>
Journals:	<p>JSAH-Society of Architectural Historians (www.sah.org/publications-and-research/jsah) Architectural Heritage-Edinburgh University Press (www.euppublishing.com/journal/arch) Architectural History (journal.eahn.org/)</p>

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Climatology and Climate Responsive Architecture

Subject Code	K8113	Semester -II
Credits	3	Subject type-Core

Learning Objectives	
1	To understand climate and its impact on architectural design.
2	To understand co-relation between climate and other environmental parameters and built form at individual and settlement level
3	To understand the use of surrounding environment as one of the strategic design parameters.

C. Learning Outcomes: Student will be able to-	
1	Familiarize with climatological influences on built environment and comfort conditions for inhabitants.
2	Explore design principles in different climatic zones

Units	Content
Unit I	Basic Climatology <ul style="list-style-type: none"> - Introduction: To climate, weather, earth, sun relationship. Global, Macro and Micro climate. Importance of climate in architecture. - Elements of climate: Temperature, rainfall, humidity, wind, solar radiation etc.
Unit II	Basic Climatology <ul style="list-style-type: none"> - Human Comfort: - Human heat balance and comfort, thermal comfort and means of thermal comfort, heat stress, effective temperature, bioclimatic chart, subjective variables - Thermal Comfort Indices - Active & Passive means of thermal control: Degree of control
Unit III	Basic Climatology <ul style="list-style-type: none"> - Structural control : Shadow formation, sun control and shading devices - Ventilation & Air movement: Study of ventilation & its functions in buildings, air flow through buildings, position & size of opening
Unit IV	Climate Responsive Architecture <ul style="list-style-type: none"> - Study of nature of climate, its physiological objectives and design criteria's and discomfort indices. Planning of internal and external spaces, surface treatments and openings etc. for various climatic zones - Case Study of a contemporary or traditional shelter in the given climate - Study of traditional /vernacular architecture from various climatic zones (Hot and Dry; Warm and Humid; Composite; Cold –Dry, Cold-wet) - Study of effect of orientation, topography, vegetation, form, building material and surfaces on building design in response to climate

Learning Resources	
Text Books:	1. Koenigsberger, Ingersoll, Mayhew, Szokolay, (1996) Manual of Tropical Housing and Building - Climatic Design, Orient Longman Limited
Reference Books:	2. G. Z. Brown and Mark Dekay, John Wiley and Sons, (2001) Sun, Wind and Light, 2nd Edition, New York

	<p>3. Baruch Givoni,(1976) Man, Climate and Architecture, U. K., Applied science Publishers, 2nd Edition</p> <p>4. T. N. Sheshadri,(2001) Climatological and Solar Data for India, Meerat, SaritaPrakashan</p> <p>A. Krishan,(2001), Climate Responsive Architecture, Tata Mcgraw Hill</p>
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment	
1	Case study of a climate responsive building
2	Study of shading devices in a building.
3	Performance of openings for light and ventilation
4	Site-Analysis (Climatic context) considering various climatic elements.

Workshop-Model Making and Building Appraisal

Subject Code	K8114	Semester -II
Credits	2	Subject type-Core

Learning Objectives	
1	To understand appreciation in architecture.
2	To understand how to read a building.

Learning Outcomes: Student will be able to	
1	Explain building using architecture language.
2	Analyses components of the building.
3	Represent same building in model format.
4	Apply model making as a tool of expression.

Units	Contents
Unit I	Aspects of appraisal - Aesthetics, Technical, Financial, Economic, Environmental and anthropological appraisals.
Unit II	Art consciousness - Aesthetics, perception, symbolism, expression, style, fashion, appropriateness and values.
Unit III	Building Appraisal - Understanding the meaning of appreciation and its normative criteria such as Form, space, site, function, structure etc.
Unit IV	Analysing design - Identification of place, Basic and modifying elements of architecture, geometries, Themes in Spatial organization - Appreciation of designer skills, theories of perception and variability of perception.
Unit V	Model Making

Learning Resources	
Text Books:	1. Simon Unwin (2009). <i>Analysing Architecture</i> third edition, revised and enlarged. USA and Canada by Routledge
Reference Books:	1. Corol Davidson cragoe(2008). <i>How to read building: A crash course in architectural styles</i> .NewYork,Rizzoli. 2. John Mittendorf and Dave Dodson (2015). <i>The art of readingbuilding</i> .USA.Penwell Cooperation. 3. Corol Davidson cragoe(2008). <i>How to read building: A crash course in architecture</i> New York, Herbert press Ltd
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Assignment	
1	Building appraisal Essay/report with sketches /Photographs
2	Model of a structure

Semester – III

Architectural Design -III

Subject Code	K8201	Semester -III
Credits	6	Subject type-Core

Learning Objectives	
1	To study and explore properties and behavior of different structural materials
2	To introduce students to a design process with a focus on materials and structural systems
3	To develop capacity of third dimensional thinking in students
4	To understand the process of multi activity space designing

Learning Outcomes: students will be able to	
1	Make appropriate choice of material based on the requirements of the design project
2	Explore properties of a particular material to its fullest.
3	visualize and think in third dimension and translate it into two dimensional design
4	synthesize and reflect analytical understanding of multi activity spaces into Architectural Design

Units	Contents
Unit I	Exposure to Materials - Introduction and knowledge of different materials and innovative structural systems
Unit II	Exploration of Forms - Exploration of innovative forms of structures based on the behavior of materials
Unit III	Design Demonstration - Introduction to a complex multi activity space design - Demonstrating the best use of the studied material/s in this space

Learning Resources	
Text Books:	
Reference Books	<ol style="list-style-type: none"> 1. Ching F. D. K. (2007), <i>Architecture: form, space, and order</i>, New Jersey, Canada, John Wiley and sons. 2. Editors of Phaidon Press (2004), <i>The Phaidon Atlas of Contemporary World Architecture</i>, Phaidon Press; Comprehensive Edition. 3. Salvadori M., & Robert H., (1975), <i>Structure in architecture: the building of buildings</i>, Cornell University, Prentice-Hall 4. Shankar P., (2014) <i>Himalayan Cities: Settlement Patterns, Public Places and Architecture</i>, New Delhi, India, USA, Canada, Niyogi Books.
Websites:	
Journals:	

Assessment	Marks
I.A.	Internal Assessment
	Refer To 'Rule number 6, sub point 6.2.2.'
U.E.	University Examination
	60

	Assignments or portfolios based on entire syllabus as mentioned below.	
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Assignment	
1	Analysis of different materials and structural systems through research and market surveys
2	Experimentation with models to explore properties, strengths, weaknesses, possibilities of different configurations of chosen materials (application of lateral thinking process)
3	Drawing portfolio for design of a complex multi activity space design (e.g., bungalow of some celebrity or professional, a small neighborhood shopping, primary health clinic, departmental store, small scale community housing, etc.

Building Construction and Materials-III

Subject Code	K8202	Semester-III
Credits	6	Subject type-Core

Learning Objectives	
1	To involve students in a number of drawing exercises that will analyze the Various building components in a simple framed structure.
2	To inform the properties and characteristics of different roofing and flooring materials

Learning outcomes: Student will be able to	
1	Understand the construction techniques of different building components like staircase and roof.
2	Acquire the knowledge of different flooring materials and its construction techniques.

Units	Contents
Unit I	Staircase <ul style="list-style-type: none"> - Design Consideration - Principles and components of staircase - Types of staircases - Staircase in Timber, steel and stone
Unit II	Roof <ul style="list-style-type: none"> - Timber Roofs: General idea of various forms in timber for different spans. General information of timber trusses, fixing of Mangalore tiles. - Steel roofing: Simple ridge roof trusses for various spans, design consideration, advantages, Connections of various members supported on RCC column, Brick piers, fixing of G.I. and A.C. and Aluminum sheets, gutter types, wind bracing etc. - Steel North light Roofing system: Connections, Gutters, paneled glazing etc. - Steel Monitor roofs: on steel Stanchions, Connections, Gutters, paneled glazing etc. - R.C.C. roofing types: Flat slabs (one way and two ways), vaults, domes, Grid slabs. - Masonry vaults and domes
Unit III	Floors <ul style="list-style-type: none"> - Specialized timber flooring for: - Dance halls, Sports halls etc. - Parquet flooring details. - General idea of timber floors in relation to spans, load transmission, Jack arch and composite floors. - Flooring & paving materials such, IPS Finish, Mosaic Tiles, and Plain Cement Tiles. Natural stones like Shahabad, Tandoor, Kota, Kadappa, Marble, Granite, etc. - Glazed and Ceramic Tiles, PVC Rubber, Linolium, Carpet etc

Unit IV	Study of Materials <ul style="list-style-type: none"> - Roofing materials. - Different flooring materials. - Importance of water proofing, its need in building construction. - Traditional and modern systems of water proofing and various water proofing materials available in the market
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Text Books:	<ol style="list-style-type: none"> 1. Rangwala S. C.(2007)<i>Engineering Materials</i>. Gujarat,Charotar, Publishing House. 2. Duggal S.K.(2009)<i>Building materials</i>. New Delhi, New Age International.
Reference Books:	<ol style="list-style-type: none"> 1. Don A. Watson,(1972)<i>Construction Materials and Processes</i>, New York, McGraw Hill. 2. WB Mackey,(1981)<i>Building construction, Vol 3,4</i>.UK, Longman UK.
Websites:	www.slideshare.net/mohdhasrimohdhasim/superstructure-construction
Journals:	Journal of construction engineering, technology stmjournals.com/index.php?journal=jocetm Master builder -construction magazine, construction news(www.masterbuilder.co.in)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation. (min.4drgs.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different design in staircase for prescribed projects. (Under discretion of the subject faculty)

Theory of Structure -III

Subject Code	K8203	Semester-I
Credits	2	Subject type-Core

Learning Objectives	
1	To understand types-indeterminate and analysis of structures
2	To understand behavior of different structural elements

Learning Outcomes: Student will be able to	
1	develop understanding of basic requirements of framed structure
2	develop understanding of behaviour of basic structural elements
3	understand importance of basic structural elements in structural systems

Units	Contents
Unit I	Shear force and bending moment diagram - Simply supported beams, cantilever beams and overhang beams for simple combinations of the cases mentioned in segment 1.
Unit II	Deflection in beams - Using formulae for standard cases simply supported and cantilevers reaction of propped cantilever. Maximum and zero deflection conditions for simply supported and cantilever beams. Factors affecting deflection. Importance of deflection in design of structural elements.(no complicated problems with double integration
Unit III	Introduction to arches - Two hinged and three hinged. Differentiate between beam and arch action. (no problems) - Suspension structures: their behaviour and sample analysis. (no problems)
Unit IV	Fixed beams - Concept of fixity and end moments using formulae. Deflected shape and placement of steel. (no analysis) - Continuous beams Concept of continuity and moments using co-efficients from IS 456, concept of distribution of moments based on stiffness only explanation (no analysis by moment distribution method)

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Dongre A.P. (2011)<i>Strength of Materials</i>.Pune/Hyderabad,Scitech Publications. 2. Deo S.S.(2013)<i>Strength of Materials</i>.Pune,NiraliPrakashan. 3. S B Junnarkar and Dr. H J Shah.(2012)<i>Mechanics of Structures Vol. I & II</i>.Anand,Charotar Publishing house.
Reference Books:	<ol style="list-style-type: none"> 1. Parikh Janak P. (2002)<i>Understanding the concept of structural design and analysis</i>.Anand,Charotar Publishing house. 2. PanditG.S.Gupta S.P.(2002)<i>Structural analysis a matrix approach</i>.New Delhi, 3. Tata McGraw-Hill Publishing company limited. 4. Varghese P.C.(2001)<i>Limit state design of reinforced concrete</i>.New Delhi,Prentice-Hall of India.
Websites:	

Journals:	
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Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment	
1	Problems of SFD, BMD
2	Deflection (limited to the standard load cases mentioned in segment 1) deflection problems using formulae, study of behavior of Arches, suspension bridges
3	Behavior of fixed and continuous beams.
	Making models of fixed beam, continuous beams, arches, suspension bridges, tensile structures, deflection of long span structures.

Creativity & Communication -III

Subject Code	K8204	Semester -III
Credits	3	Subject type-Core

Learning Objectives	
1	To enhance creative skills with different techniques and sources of inspiration.
2	To enhance digital communication skills.

Learning Outcomes: Student will be able to	
1	Understand various methods of improving creative skills.
2	Use different sources of inspiration to improve creative skills.

Units	Contents
Unit I	Techniques for improving Creativity - Brainstorming, Lateral Thinking, Random Combinations, Use of Manipulative Verbs, Tree of Possibilities, Abstraction, Transformation, Use of the Ridiculous, Matrix of Ideas, Role of Memory and Experience
Unit II	Sources of inspiration for Creativity - Material, Geometry, History, Nature & Climate, Mimesis, Multicultural, Association with other arts, Biographies, Fantasy.
Unit III	Graphical Communication - Introduction and application of computer software for graphical communication

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Ching Francis, D. K. (2007) <i>Architecture: Form Space & Order</i>, New Jersey, John Willy and Sons 2. Ching Francis, D. K. (1999) <i>Visual Dictionary of Architecture</i>, New Jersey, John Willy and Sons 3. Yatin Pandya (2014) <i>Elements of Space Making</i>, Ahmedabad, Mapin Publishing 4. ShirishVasantBapat (1993) <i>Basic Design and Anthropometry</i>, Pune, Bela Books 5. Barry A Berkus (2000) <i>Architecture, Art – Parallels and Connections</i>, Australia, Watson-Guptill Publications 6. Bacon E.N. (1974) <i>Design of Cities</i>, England, Penguin Books 7. Akiko Busch (1991) <i>The Art of Architectural Models</i>, Hong Kong, Design Press 8. Nick Bunn (2010) <i>Architectural Model Making</i>, London, Laurence King Publishing 9. Paul Jackson, Angela A Court, Marion Elliot (1993) <i>The Ultimate Papercraft and Origami Book</i>, United Kingdom, Acropolis Books 10. Thompson I (1999) <i>Frank Lloyd Wright: A Visual Encyclopedia</i>, London, Grange Book Plc 11. Edward De Bono (1990) <i>Lateral Thinking</i>, London, Penguin Books
Websites:	www.artinarch.org www.edwdebono.com
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination-	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
	Drawing portfolio consisting of relevant exercises including –
1	Any two exercises to demonstrate Techniques for improving Creativity (2D and 3D)
2	Any two exercises to explore Sources of inspiration for Creativity (2D and 3D)
3	One exercise to demonstrate Graphical Communication
	(The nature of exercises will depend on the focus of the studio)

Architectural Drawings and Graphics-III

Subject Code	K8205	Semester -III
Credits	5	Subject type-Core

Learning Objectives	
1	To understand the relation between depth of building elements and shades and shadows.
2	To understand three - dimensional view of architectural projects

Learning Outcomes: student will be able to	
1	Represent Sciography in Plan and Elevation of Architectural design project
2	Sketch perspective of Interior and Exterior.

Units	Contents
Unit I	Sciography - Sciography in buildings. - Projection of sciography in plan and elevation
Unit II	Perspective - Anatomy of perspective: Station point, Eye level, Cone of vision, Picture plane, Horizon line, Ground line, Vanishing points. - Types of perspectives: One point, Two point, Three point
Unit III	Perspective - Perspective drawing by, Measuring pt. method, directs projection method Grid method etc - Perspectives of simple and complex blocks - Perspectives of simple household furniture items. - Perspectives of interiors - Perspectives of Residences
Unit IV	Sciography in perspective

Learning Resources	
Text Books:	1. F. D K. Ching (2009) <i>Architectural Graphics</i> , New Jersey, John and Wiley and Sons. 2. Francis D K Ching (1989) <i>Drawing a creative process</i> , Van Nostrad Reinhold 3. Hugh C. Browing (1996) <i>The Principles of Architectural Drafting</i> , New York, Watson-Guptill Publications. 4. Rangwala(1991) <i>Civil Engineering Drawing</i> , Gujarat, Charotor Publishing House.
Reference Books:	1. Gill R.W.(2011) <i>Rendering with Pen and Ink</i> , London, Thames &Hudson ltd. 2. Sleeper R. (2000) <i>Architectural Graphic Standards</i> , New York, John Wiely and Sons.
Websites:	http://www.assignmenthelp.net/sciography-of-geometrical
Journals:	

Assessment	Marks
I.A.	40
	20
	Refer To 'Rule number 6, sub point 6.2.2.'

U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments		
I.A. Assignments		
1	Sem II AD Project to be presented with 2 point Perspective using any method.	
2	Sciography of overhangs, stairs porticos pergolas to be enhanced on vertical, horizontal and curved surfaces.	
U.E. Assignments		
3	Drawing portfolio - Adequate number of drawings covering all the units.	

History of Architecture-II

Subject Code	K8206	Semester -III
Credits	3	Subject type-Core

Learning Objectives	
1	To understand development of architecture as a process of contextual and cultural evolution rather than simply as a product.
2	To acknowledge and interpret from history, best design guidelines which respond aptly to the vernacular character of that place, the lifestyle of the users and building traditions of that time.
3	To gain knowledge of the development of architectural form with reference to technology, style and character

Learning Outcomes: Student will be able to	
1	Explore Geography, Politics, Economy, Social Systems, Religion, Paintings and Sculptures and its influence on Architecture at different periods of time.
2	Acquire knowledge of the development of architectural form with reference to technology, style and character in the Indian context through the evolution of the temples, mosques and tombs in the various phases of Hindu and Islamic rule in India.
3	Acquire knowledge of the development of architectural form with reference to technology, style and character in the Western World through the evolution of the church from early Christian phase up to the Renaissance period

Units	Contents
Unit I	<p>Architecture in Indian sub-continent-Hindu Temple Architecture</p> <ul style="list-style-type: none"> - Evolution of architectural style, major influences on development of form and other architectural elements. - Gupta and early Chalukyan style - Gupta temple, Tigawa, Dasavatara Temple, Deogarh, Ladkhan and Durga temples, AiholeVirupaksha temple, Pattadakkal, Papanath temple, Pattadakkal, Cave temple, Badami, Kailash Temple, Ellora <p>Dravidian style</p> <ul style="list-style-type: none"> - Pallava - Rathas, Mamallapuram, Shore temple, Mamallapuram - Chola - Brihadeswara temple, Thanjavur - Hoysala - Keshava temple, Somnathpur - Vijayanagara - Vitthalaswami temple, Hampi, column orders - Madura - Meenakshi temple, Madurai, Sriranganathaswami temple, Srirangam <p>Indo Aryan Style</p> <ul style="list-style-type: none"> - Orissa - Parasurameswara, Mukteswara, Lingaraja temples, Bhubaneswar, Sun temple, Konark - Khajuraho - KandariyaMahadeo temple, Khajuraho - Gujarat - Sun temple, Modhera <p>Jain School</p> <ul style="list-style-type: none"> - Vimal Shah at Mount Abu, Chaumukh at Ranakpur
Unit II	<p>Architecture in Indian sub-continent -Islamic Architecture in India</p> <ul style="list-style-type: none"> - A brief introduction to origin and characteristics of Islamic architecture: building types, elements, structural systems, construction techniques

	<p>Imperial style of Delhi</p> <ul style="list-style-type: none"> - Slave dynasty - Quwat-ul-Islam Mosque, QutbMinar, Khirki Masjid, Sultan Ghari, Tomb of Iltumish, Tomb of Balban - Khilji Dynasty - Alai Darwaza., JamatKhana masjid <p>Provincial styles: (any two provinces)</p> <ul style="list-style-type: none"> - Punjab,Sind,Bengal,Gujrat,Kashmir,Jaunpur,Malwa,Deccan - Mosque: Jami – Ahmedabad, Champaner and Gulbarga - Tomb: GolGumbaj, Ibrahim Rauza, Bijapur - Civic work: Dada Hari stepped well, Adalaj <p>The Mughal phase</p> <ul style="list-style-type: none"> - Evolution of Mughal style and the different eras of rule: - Mosque: Jami – FatehpurSikri , Delhi - Tomb: Humayun, Akbar, Itmadud-daulla, TajMahal - Fort: FatehpurSikri, Red Fort, Delhi, - Regal Buildings: Birbal’s house, Jodhabai’s palace at FatehpurSikri
Unit III	<p>Architecture in Europe</p> <p>Early Christian and Byzantine Architecture</p> <ul style="list-style-type: none"> - Evolution of Church form, technique adopted to construct domes, surface treatment and material of construction - Elements of Special Attributes: - Domes, timber trusses, clear storey, pendentives - Major typologies - St. Peters, Rome (earlier one) Hagia Sophia, Constantinople <p>Romanesque</p> <ul style="list-style-type: none"> - Design evolution, planning principles and structural details - Elements of Special Attribute: Wall passages, raking arcades, triforium gallery, vaulting systems - Major typologies - Churches – St. Michelle Pavia, Campus at Pisa
Unit IV	<p>Architecture in Europe</p> <p>Gothic Phase</p> <ul style="list-style-type: none"> - Elements of Special Attribute: Structural innovations with buttresses, pointed arches, vaulting systems, window traceries, flying buttresses etc. - Major typologies - Churches- Amines Cathedral, Notre dame cathedral, Salisbury cathedral, West Ministers Abbey, castles <p>Renaissance Phase</p> <ul style="list-style-type: none"> - Elements of Special Attribute: Revived column orders, rusticated masonry, grand cornices, public architecture – piazzas- St Mark, Del Signoria - Major typologies - Churches – St. Peters Rome, St Paul’s, Palladian villas, buildings with respect to architects

Learning Resources	
Text Books:	
Reference Books:	1. Percy Brown, (1983) <i>Indian Architecture (Hindu And Buddhist)</i> . Bombay, Taraporevala and Sons.

	<p>2. Henri Stierlin, (2002) <i>Hindu India</i>. ISBN 3-8228-1767-8. Taschen GmbH.</p> <p>3. George Michell, (1995) <i>Architecture of the Islamic World</i>. London, Thames and Hudson Ltd.</p> <p>4. Sandra Forty, (2004) <i>Architecture..</i> Rochester, Grange books</p> <p>5. Sir Banister Fletcher, (1996) <i>A History of Architecture</i>. Delhi, CBS Publishers.</p> <p>6. Hiraskar, (2009) <i>The Great Ages of World Architecture</i>. New Delhi, DhanpatRai Publications (P) Ltd, 16th Reprint.</p>
Websites:	<p>http://www.twcenter.net/forums/showthread</p> <p>http://www.mughalhistory.com/humayun.htm</p> <p>www.indhistory.com</p> <p>http://www.indianetzone.com</p>
Journals:	<p>JSAH-Society of Architectural Historians (www.sah.org/publications-and-research/jsah)ArchitecturalHeritage-EdinburghUniversity Press(www.euppublishing.com/journal/arch)</p> <p>Architectural History (journal.eahn.org/)</p>

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Building Services-I

Subject Code	K8207	Semester -III
Credits	3	Subject type-Core

Learning Objectives	
1	To Study Water supply, treatments, distribution and plumbing system for various type of buildings.
2	To Study Waste water treatments, Sewer lines for various types of buildings
3	To Study Drainage system for a low and medium level building

Learning Outcomes : Students will be able to	
1	Understand how water supply and sanitation services are managed, in small and medium buildings.
2	Acquire knowledge about the principles of water supply and sanitation

Units	Contents
Unit I	Water supply - Sources of water supply. - Treatment plants and Pipe Appurtenances
Unit II	Distribution Patterns - Service Connection (Ferrule, water meter etc.) - Water storage tanks (Ground and overhead), their capacity and location. Calculation of water consumption. - Water Distribution pipes, their sizes, materials, jointing, fixing and laying
Unit III	Sanitation - Principles of sanitation. Introduction of various terminologies used in sanitation. Collection of waste matter in buildings. Various sanitary fittings and fixtures like washbasins, WC's, bathtubs, sink urinals, bidets, flushing cistern traps etc. Various traps and their functions. - Sewerage Systems: Dry conservancy method Water carriage systems. - Sewage collection and disposal system for individual house of urban areas. - Locations and use of appurtenances i.e. I.C, manholes, disconnecting chambers. - Various types of sanitary pipes, their joining, fixing and laying. Pipes and piping network. Anti- Siphonage Pipes.
Unit IV	Testing of house drains. - Sewage disposal system for individual house of rural areas or un-sewered localities (Septic tank, soak pit, cesspools, aqua privy, leeching pits. - Self-cleaning and non-scouring velocities for drain pipes. Invert levels and drains on sloping site

Learning Resources	
Text Books:	1. S.C.Rangwala,(1989) <i>Water supply and sanitary engineerin.</i> ,Gujarat, Charotar publishing house.
Reference Books:	1. AFE Wise, JA Swaffied Water,(2002) <i>Sanitary & Waste Services in buildings</i> . V Edition, Los Angeles, Mitchell Publishing, Co. Ltd. 2. C. shah,(1999) <i>Water supply and sanitary engineering</i> , Delhi,Galgotia publishers.

Websites:	http://www.slideshare.net/prinskhaleel/sanitary-and-water-supply http://www.slideshare.net/Liquidliquid/presentation-plumbing
Journals:	Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE-(www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Elective-I

Subject Code	K8208	Semester- III
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes: student will be able to	
1	Engage in systematic self study of topic they feel interested in.

Students can select one elective from the following list	
1	Traditional Building science
	<ul style="list-style-type: none"> - Introduction, Meaning, Elements etc. - Vastusastra Principles - Climatological, sustainable aspects of VastuSastra. - Relevance of vastushastra in Today's Built Environment
2	Vernacular architecture and settlements (Regionalism)
	<ul style="list-style-type: none"> - Defining Vernacular - Culture ,Tradition, Society, Climate and Shelter - Vernacular architecture in India - Study of traditional Building materials and Techniques - Study of Vernacular Settlements pattern - Style of the Maratha region
3	Environmental Studies
	<ul style="list-style-type: none"> - Environmental Factors effecting human habit such as climate, environmental pollution, environmental degradation, Green cover etc.at micro and macro scales. - Fundamentals of eco system - Environmental legislation
4	Photography
	<ul style="list-style-type: none"> - Introduction to Architectural Photography. - Techniques of Recording Building and surrounding on a film with respect to position of viewer and angle, light and shades, foreground and background, scale, colour, texture, mood, time etc. - Techniques of Photography for documentation - Photographs of drawings, models, feature of buildings and surroundings to be elaborated. - Close up Photographs - Photography practicals on: simple objects, still life composition with the play of light and shadow, Historical and modern Buildings with surroundings landscape ,Architectural details such as brackets, staircase etc.

Assessment		Marks
IA	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – IV

Architectural Design -IV

Subject Code	K8209	Semester -IV
Credits	6	Subject type-Core

Learning Objectives	
1	To understand the contextual relationship of buildings with climate and landform
2	To document rural/traditional settlement to understand the context, people, function
3	To understand the process of complex multi-activity space design

Learning Outcomes: student will be able to	
1	understand relationship of building and site, climate and landform
2	document rural/traditional settlement
3	design multi-activity spaces responding to climate and landform

Units	Contents
Unit I	Documentation and analysis of Settlement <ul style="list-style-type: none"> - Document rural settlement in terms of settlement patterns, cluster configurations and building typology. - Document and analyze influence of climate and landform and all three levels - Document and analyze any traditional knowledge systems, structural system and architectural vocabulary of that place. - Documentation of social structure, religious and cultural practices that guide the built form
Unit II	Application of Context <ul style="list-style-type: none"> - Proposal of small design insert responding to existing context of the settlement based on the analysis
Unit III	Design Demonstration <ul style="list-style-type: none"> - Climate responsive design demonstrating passive design principles

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Baruch G., (1976), <i>Man, Climate and Architecture</i>, 2nd Edition, U. K., Applied Science Publishers. 2. Ching F. D. K. (2007), <i>Architecture: form, space, and order</i>, New Jersey, Canada, John Wiley and sons. 3. Dingle N., (2013), <i>Zarokha</i>, Brain Tonic Publishing. 4. Dingle N., (1998), <i>The Introvert and Extrovert Aspects of the Marathi House'</i>, House and Home in Maharashtra, USA, Oxford University Press. 5. Editors of Phaidon Press (2004), <i>The Phaidon Atlas of Contemporary World Architecture</i>, Phaidon Press; Comprehensive Edition. 6. Shankar P., (2014) <i>Himalayan Cities: Settlement Patterns, Public Places and Architecture</i>, New Delhi, India, USA, Canada, Niyogi Books. 7. Jain K. B. & Jain M., (2001), <i>Architecture of the Indian Desert</i> 8. Koenigsberger O.H.; Ingersoll, T.G.; Mayhew, Alan; Szokolay, S.V., (1980), <i>Manual of Tropical Housing and Building. Part one: Climatic design</i>, Longman Used.

	9. Steele J., Doshi B.V., (1998) <i>The complete architecture of Balkrishna Doshi: rethinking modernism for the developing world</i> , India, Super Book House
Websites:	
Journals:	Ahmed Muhaisen, S. "Shading simulation of the courtyard form indifferent climatic regions", <i>Building and Environment</i> Vol. 41, pp. 1731-1741, 2005.

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Rural/traditional settlement studio - Drawing portfolio, Models
2	Drawing portfolio or a detailed model for short design-insert related to settlement study shall be carried out as a time bound exercise
3	Drawing portfolio for design of a small campus involving complex issues of site, topography, integration, environment (primary school, sports club, small resort / institute, primary health care, nursing home, etc.)

Building Construction and Materials-IV

Subject Code	K8210	Semester -IV
Credits	6	Subject type-Core

Learning Objectives	
1	To involve students in construction process of special construction of cavity walls and retaining walls.
2	To aware student for natural disasters and techniques of protection
3	To inform the students about materials like steel and aluminum its properties

Learning Outcomes: student will be able to	
1	Understand special construction of masonry walls.
2	Understand site development with retaining walls with respect to different materials.
3	Be aware about earthquake resisting structures and its protections.

Units	Contents
Unit I	Retaining Wall - Retaining walls and its terminology, mass retaining wall in bricks, Stones etc. and cantilever retaining wall in R.C.C.
Unit II	Cavity Walls: - Principles of Cavity wall construction & advantages of Cavity wall - Cavity wall in Brick, Stone and Concrete blocks - Precautions in Hollow Concrete wall construction - Reinforced and Decorative Brick masonry, Jali construction
Unit III	Aluminum Doors & Windows - Aluminum and P.V.C. Windows - Aluminum and P.V.C. Doors
Unit IV	Earthquake Resistant Structures - For engineered and non-engineered construction.
Unit V	Study of Materials - Steel and Aluminum. - Water concrete admixtures. - Paints and varnishes

Learning Resources	
Text Books:	1. Rangwala S. C.(2007) <i>Engineering Materials</i> . Gujarat,Charotar, Publishing House. 2. Duggal S.K.(2009) <i>Building materials</i> . New Delhi, New Age International.
Reference Books:	1. J. S. Foster, Roger Greeno (2007) <i>Mitchell's Structure & Fabric: Part 2</i> .New York,Taylor and Francis group
Websites:	www.slideshare.net/vikskyn/earthquake-resistant-structure
Journals:	Journal of construction engineering, technology stmjournals.com/index.php?journal=jocetm) Master builder -construction magazine, construction news(www.masterbuilder.co.in)

Assessment	Marks
I.A.	Internal Assessment 40

	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation. (min.4drgs.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different design in aluminum door and window for prescribed projects. (Under discretion of the subject faculty).

Theory of Structures-IV

Subject Code	K8211	Semester -IV
Credits	2	Subject type-Core

Learning Objectives	
1	To understand basic structural concepts
2	To understand behavior of RCC as a material for framed structure
3	To understand fundamental beam column slab construction and loading

Learning Outcomes: student will be able to	
1	develop understanding of basic requirements of framed structure
2	develop understanding of strength of RCC structure
3	Understand different loads affecting strength and stability of structure.

Units	Contents
Unit I	<p>Design of RCC structures using limit state method (IS456)</p> <ul style="list-style-type: none"> - Different type of loads: dead load, live load, wind load, earthquake load. - Calculation of dead load (self weight) if dimensions of a beam, column, wall or slab and unit weight of material are given. - Principles and applications of live load and wind load in different types of structures such as residential, commercial, institutional etc. - Introduction to related IS specifications.
Unit II	<ul style="list-style-type: none"> - RCC framed structures flat roof i.e. beam slab column system - IS 456 provisions for removal of formwork, nominal cover. - Design of one way and two way slab, cantilever slab, load transfer from one way and two way slabs to beams and cantilever slab. - Beam design 1) simply supported 2) cantilever and 3) continuous. Continuous beam moments to be found using co-efficient. Explain similar details for continuous slab - Design of columns. Explain the structural actions on columns, explain slenderness ratio and its effect on load carrying capacity of columns, design of only short axially loaded columns. Explain uni-axial and biaxial bending cases. - Introduction to doubly reinforced beams and T or L beams. (no design problems)

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Dr.Shah V.L. & Dr. Karve S.R.(2014)<i>RCC Theory and Design</i>.Pune,Structures Publishers. 2. Shah H.J. (2013)<i>Design of Reinforced Concrete Structures</i>.Anand,Charotar Publishing house. 3. Sinha S.N. (2014) <i>Reinforced Concrete Design</i>.New Delhi,Tata McGraw-Hill Publishing Company limited.
Reference Books:	<ol style="list-style-type: none"> 1. Dr.Shah V.L. & Dr. Karve S.R.2014) <i>Illustrated design of reinforced concrete buildings(design of G+3 storied office/residential building)</i>.Pune, Structures Publishers. 2. Negi L.S.&Jangid R.S.(2000)<i>Structural analysis</i>. New Delhi,Tata McGraw-Hill Publishing company limited
Websites:	Bureau of Indian standards

Journals:	IS: 456 - 2000
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Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	calculation of dead load, live load, G+1 building slab design, one beam, one column design, make drawings and schedule for the same

Computer Aided Design and Drawings

Subject Code	K8212	Semester -IV
Credits	4	Subject type-Core

Learning Objectives	
1	To develop computer aided drafting skill in 2D and 3D.
2	To familiarize with various software available for documentation, presentation and drawing purpose.
3	To understand the use of computer for graphical applications.
4	To introduce and use of various software's available for computer application in Architecture.

Learning Outcomes: Student will be able to	
1	Understand the use of computer as a tool for imagination and design.
2	Apply architectural presentation techniques using different software's.
3	Know how to use commands rather than what commands are.
4	Create 3D compositions and drafting plans.

Units	Contents
Unit I	Computer Aided Drawing (2D Composition) <ul style="list-style-type: none"> - Introduction of Auto CAD as drafting tool. - Basics of 2D drafting, Drawing simple objects, projections and plans etc. - Preparation of 2 dimensional drawing with dimensioning. - Creating layers, styles, Blocks, line types etc
Unit II	Computer Aided Architectural Modeling <ul style="list-style-type: none"> - Introduction to Auto cad 3D/Sketch up /3Dmax. - Drawing 3D standard solid models. - Drawing 3D planes and surfaces. - Complex 3D commands such as extrude/revolve, meshes and solids - Solid editing in 3D such as subtract - General introduction to rendering and light effects
Unit III	Computer aided presentation skills <ul style="list-style-type: none"> - Introduction of various software available for Architectural presentation. - Introduction to power point, Microsoft excel, Microsoft word
Unit IV	Animation/Walkthroughs

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. George Omura(1998).<i>Mastering Autocad</i>,Singapore,Tech publications. 2. Ted Boardman and Jercy Hubbell (1998).<i>Inside 3D studio Max2</i>, volume II,Modeling and Materials,New Delhi,G.C.Jain for techmedia. 3. Stephen Paul Jacobs(1991)<i>The CAD Design studio,3DModeling as a Fundamental Design Skill</i>,New York,McGraw-Hill,Inc. 4. Durvid Frey (1998)<i>Autocad 14</i>,New Delhi,BPB publications.
Reference Books	As required by subjects /topics in a particular semester.

Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Rendering drafting for Sem.III design .
2	Prepare digital drawings for Sem.III design portfolio.
3	Create 3D model.

History of Architecture-III

Subject Code	K8213	Semester -IV
Credits	3	Subject type-Core

Learning Objectives	
1	To gain knowledge of the development of architectural form with reference to style and character in the Indian context through the evolution of colonial Architecture in the country
2	To understand the Industrial era as evolving within specific contexts including aspects of social and political factors.
3	To gain knowledge of the development of architectural form with reference to technology, style and character in the Western World through the Industrial revolution and in the phases covering the Art and Craft , Art Nouveau styles

Learning Outcomes: Students will be able to	
1	Explore spatial and stylistic qualities associated with Colonial architecture.
2	Explain architecture as an outcome of various social, political and economic upheavals
3	Comprehend the condition of Industrial Revolution and its impact on architecture
4	Understand Art and Craft, Art Nouveau styles with reference to Industrial Revolution.

Units	Contents
Unit I	<p>Colonial Architecture in India</p> <ul style="list-style-type: none"> - Colonial Architecture under British, Portuguese and French with reference to industrial revolution and emergence of new materials and construction techniques. - Indian Colonial architecture-British: The styles and trends of architecture brought by British to India and their evolution – The impact of Indo-Sarcenic style on the British Architecture in India – The characteristics of British Colonial Architecture with examples from work of Edwin Lutyens. - The Impact of Portuguese architecture in India – The characteristics of Portuguese Colonial Architecture with examples from Goa-Bom Jesus Cathedral Complex-Old Goa. - The Impact of French Architecture in India – The characteristics of French Colonial Architecture with examples from Puducherry, Maheetc - The Impact of French Architecture in India – The characteristics of French Colonial Architecture with examples from Puducherry, Maheetc
Unit II	<p>Baroque Art, Rococo Art</p> <ul style="list-style-type: none"> - Roman Baroque churches: The central plan modified – St. Peters, Rome; - French Baroque: Versailles - English baroque – Sir Christopher Wren; - St. Paul’s London – Domestic Architecture in England. - Rococo Architecture – Interiors – hotels
Unit III	<p>Neo classical Art and Architecture</p> <ul style="list-style-type: none"> - Beginnings of modernity –Origin and development of Neo Classicism Structural Neo classicists: Laugier, Soufflot, Schinkel, Labrouste - Romantic Neo classicists: Ledoux, Boullée, Durand, Jefferson

Unit IV	<p>Industrial Revolution</p> <ul style="list-style-type: none"> - Causes, consequence and impact in Architecture – Urbanization in Europe and America- split of design education into architecture and engineering streams- Emergent new building / space types. Growing need for mass housing .Its influences in building, technology and modern building materials Steel, glass, RCC etc. Industrial exhibitions- Chicago School and skyscraper development. - Arts and Crafts in Europe and America : Morris, Webb - Art Nouveau: Opposition to industrial arts and production Horta, Van De Velde, Gaudi, Guimard, Mackintosh Hoffman, Olbrich- Wright’s early works
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Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Kenneth Frampton, (1994) <i>Modern Architecture: A Critical History</i>. London, Thames & Hudson. 2. James C. Harle, (1994) <i>The Art and Architecture of the Indian Subcontinent</i>. Second Edition. Yale, Yale University Press. 3. Banister Fletcher, (1996) <i>A History of Architecture</i>. New York, Architectural Press, 4. Raeburn Micheal, (1988) <i>Architecture of the Western World</i>. England, Popular Press.
Reference Books:	<ol style="list-style-type: none"> 1. Hiraskar, (2009) <i>The Great Ages of World Architecture</i>. New Delhi, Dhanpat Rai Publications (P) Ltd, 16th Reprint. 2. Christian Norburg-Schulz,(1993) <i>Meaning in Western Architecture</i>. Rizzoli, Revised edition, 3. Ed.HenriStierlin,(2002) <i>Architecture of the world- Baroque</i>. ISBN 3-8228-9300-5.Germany, BenediktTaschenVerlagGmbtt
Websites:	<p>www.culturalindia.net › Indian Architecture www.britannica.com/EBchecked/...architecture/.../Baroque-and-Rococo www.greatbuildings.com/types/styles/neo-classical.html https://thearchiblog.wordpress.com/.../impact-of-industrial-revolution http://www.quora.com/What-is-impact-of-the-Industrial-Revolution-on-nineteenth-century-architecture</p>
Journals:	<p>JSAH-Society of Architectural Historians (www.sah.org/publications-and-research/jsah) Architectural Heritage-Edinburgh University Press (www.euppublishing.com/journal/arch) Architectural History (journal.eahn.org/)</p>

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Theory paper	

Assignments	
1	Study of Colonial Architecture in India with literature survey
2	Analysis of various Architecture and Art styles studied and their development
3	Report based on field study.

Surveying & Leveling

Subject Code	K8214	Semester -IV
Credits	4	Subject type-Core

Learning Objectives	
1	To understand various land forms.
2	To introduce surveying as a method to explain land form and its utility in site planning.
3	To acquaint students with the physical surveying and levelling work in order to, Measure and document built and non-built spaces.
4	To prepare and interpret of Base Map for Architectural Design Projects.
5	To read and interpret various forms of cartographic presentation.

Learning Outcomes: Students will be able to	
1	Understand importance of land forms and topography and its significance in site planning /Design.
2	Calculate area of a site / plot.
3	Discuss slope of land for site planning.
4	Design services and buildings on sloping terrain

Units	Contents
Unit I	<ul style="list-style-type: none"> - Introduction to surveying and survey equipments, understanding land topography and its relevance in Architecture. - Methods of Surveying: Chain and Compass, Plane Table Survey, computation of areas
Unit II	<ul style="list-style-type: none"> - Methods of Levelling: Contour Survey, Use of Theodolite. - Use of electronic equipment like EDM, Total Station etc.
Unit III	<ul style="list-style-type: none"> - Introduction to remote sensing and aerial photographic surveying etc. - (Electronic Total Station) ETS Survey - Study and analysis of Topo-sheet

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. N.N. Basak ,(2004) <i>Surveying and Levelling</i> , New Delhi ,Tata Mcgraw Hill, 2. Kanetkar, T.P and Kulkarni, S.V (2013) <i>Surveying and Leveling</i>. Pune Vidyarthi Pune. 3. R.Subramanian (2012) <i>Surveying and Leveling</i>Roorkee,Cyber TechPublication.
Reference Books:	<ol style="list-style-type: none"> 1. David Clerk, Surveying Vol -I & II, 2. Dr. K.R. Arora, Surveying Vol -I & II, 3. S.K. Duggal, Fundamentals of Surveying Milton.O.Schimidit.
Websites:	<p>www.aboutcivil.org, www.cambridge.org, www.civilprojectsonline.com</p>
Journals:	<p>International Organization of Scientific Research (IOSR) IOP Science (Institute of Physics), American Journal of Engineering Research (AJER)</p>

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	To measure plot by linear method and determine the area.
2	To measure the contour plot and work out the site sections to understand levels and slopes.
3	To prepare small report with presentation of various equipments used in surveying and leveling
4	Measurement of plot by using different methods. (Equipments, plot selection can be done by the student and approved by instructor
5	To measure the live plot by using chain & compass, plane table survey, and prepare drawing for the area calculation
6	Survey of a given area of city road to understand slope, road details by using chain & compass, plane table survey .submission will in the form of drawings and digital presentation
7	Report on topics related to remote sensing and aerial photographic survey.

Building Services-II

Subject Code	K8215	Semester -IV
Credits	3	Subject type-Core

Learning Objectives	
1	To Study basics of electricity and wiring systems within domestic and commercial buildings.
2	To Study fundamentals of lighting and lighting design.
3	To familiarize the students with the fundamentals of acoustics and principles in designing various built environment

Learning Outcomes: Student will be able to	
1	Understand the basics of Electricity and wiring system
2	Understand various fundamentals of Lighting and Lighting design
3	Learn and evaluate fundamentals of acoustics and its applications in buildings.

Units	Contents
Unit I	Electrical Services. <ul style="list-style-type: none"> - Different wiring systems, fuses and MCBs, electrical fittings and appliances. Detailed layout of electrical services in residences
Unit II	Daylighting <ul style="list-style-type: none"> - Day lighting, sky condition, daylight availability graph, sky condition square. - Luminance levels for various sky conditions as a function of solar altitude, daylight factor, daylight factor standards, components of daylight factor, functional objectives of daylight, - Site criteria, building configuration, building orientation. - Day light apertures, glare control, shading devices- external and internal, measurement of day lighting
Unit III	Illumination (Artificial lighting) <ul style="list-style-type: none"> - Light radiation, its unit, laws of illumination, types of illumination schemes –direct, semi direct, diffused lighting and their design consideration - Light sources, various types of lamps and their characteristics - Types of luminaries for interior and exterior - Exterior lighting for monuments, gardens, fountains, sculptures etc
Unit IV	Acoustics <ul style="list-style-type: none"> - Frequency range of Audible sound. - Propagation of sound, sound reflection, diffusion, diffraction, sounds insulation. - Echo, Reverberation and Doppler effect. - Sound absorption, absorbing materials, their classification and application. Sound Reflection and reflecting materials, their classification and application. - Space layout consideration and Buffer zones - Noise and Noise control Noise criteria curves, noise from ventilation and AC systems. - Floor and ceiling construction for noise insulation. - Floating floors, outdoor barriers for noise Control. - At least one live case study in detail of acoustical treatment of

	<ul style="list-style-type: none"> - Auditorium, Lecture halls/Conference hall (any performing space) - Acoustical defects and remedies.
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Learning Resources	
Text Books:	
Reference Books:	1. E.P. Ambrose,(1968) <i>Electric Heating</i> . New York, John Wiley & Sons Inc. 2. Philips,(1964) <i>Lighting in Architectural Design</i> . New York, McGraw Hill. 3. R. G. Hopkenson& J. D. Kay, (1969) <i>The lighting of Buildings</i> , London, Faber& Faber. 4. National Building Code of India, 2005 (NBC 2005)
Websites:	www.slideshare.net/haroldtaylor1113/9-acoustics-sound-and-noise-control https://www.scribd.com/doc/59706240
Journals:	Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE-(www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Theory paper	

Assignments(Any 2)	
1	Design electrical layout for a low or medium size building.(an individual /independent unit)
2	Layout of acoustical space with reverberation time calculations
3	Daylight Calculation in medium sized space.

Elective - II

Subject Code	K8216	Semester IV
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes: student will be able to	
1	Engage in systematic self study of topic they feel interested in.

Students can select one elective from the following list	
1	Passive Design Principles (SBDP) <ul style="list-style-type: none"> - Meaning ,Need of Passive Cooling - Principles of Passive Cooling - Passive Cooling in Different Climatic zones - Case studies
2	Seminar –I (Design Philosophies of Master Architects) <ul style="list-style-type: none"> - Independent study and documentation of architectural and allied subjects by individual student along with oral and visual presentation. - The seminar shall be a research paper on a topic related to Architecture.
3	Human settlements <ul style="list-style-type: none"> - Origin and growth of human settlement. - Role of River Banks in growth of human settlement. - Study of ancient Indian settlements like Mohenjodaro, Taxila, Nalanda. - Study of ancient Indian cave settlements of Ajanta, Ellora, Elephanta. - Ancient texts and treatises on settlement and area planning in India. - Historical survey of the city as an expression of the vitality of a civilization. - Human settlements during ancient medieval and modern periods in and India, and other parts of the world. - Characteristics of human settlements built by Hindu and Islamic Rulers in India
4	Communication skill/public speaking <ul style="list-style-type: none"> - Basic principles and Benefits of Better Communication, Communication Theory, Organizing Thoughts, Valuing People, Choosing Appropriate Words, Using Non Verbal Behaviors (Body Language, Voice Inflection) - Conducting Meetings, Giving Presentations, Writing for Business, Writing Letters, Memos and minutes, Writing Reports and reviews, Using Visuals, Interviewing and facing interviews. - English usage, grammar and composition, learning to listen and speak correctly (One to one communication, on the telephone, Group discussions) - Basic knowledge of effective use of ms word and excel and power point. - Business Etiquettes: Professional Image, Introductions and Greetings, Networking Manners, General, Workplace Manners, Life on the Cube Farm, Interacting With Superiors, Manager's Manners, Business Meetings,

	Business Gifts, Business Cards, Telephone Manners, Cell Phone Etiquette, E-Mail Etiquette, Gender-Free Etiquette, Business Dining, Avoiding Social Blunders When Abroad, Dealing with Angry Customers
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Assessment		Marks
IA	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – V

Architectural Design -V

Subject Code	K8301	Semester -V
Credits	8	Subject type-Core

Learning Objectives	
1	To understand and reflect 'culture as maker of space'

Learning Outcomes: Students will be able to	
1	Develop analytical skill set for spatial design of built spaces
2	Synthesize and translate analytical understanding into Architectural Design

Units	Contents
Unit I	Research and analysis of community living with examples.
Unit II	Study of theories on neighborhood planning concepts, community living, campus planning principles etc.
Unit III	It can be a small eskii project like a club house, small community hall, badminton court.

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Bhatt V. & Seniver P., (1990), <i>Contemporary Indian Architecture: After The Masters</i>, Ahmedabad, USA, Mapin Publishing Pvt. LTD. 2. Kanvinde A. P. & Miller J. H., (1969), <i>Campus Design in India: Experience of a Developing Nation</i>, Jostens/American Yearbook Company 3. Mehta J., (2011) <i>Rethinking Modernity</i>, New Delhi, India, Niyogi Books 4. Pressman A., <i>Design Architecture the elements of Process</i>, USA, Routledge 5. Pandya Y., (2005) <i>Concepts of Space in Traditional Indian Architecture</i>, India, New Jersey, Mapin Publishing. 6. Salvadori M., & Robert H., (1975), <i>Structure in architecture: the building of buildings</i>, Cornell University, Prentice-Hall 7. Steele J., Doshi B.V., (1998) <i>The complete architecture of Balkrishna Doshi: rethinking modernism for the developing world</i>, India, Super Book House 8. Unwin S. (4th Ed), <i>Analysing Architecture</i>, Canada, Routledge
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Design Project demonstrating principles of community living, neighborhood planning etc. on any one of the following - Group Housing, High-end residential building, housing for economically weaker sections, Community Housing etc. –

	Drawing portfolio and model.
2	Design Project on any one of the following – Club House, Community Hall, Sports Club etc. which can be an extension of the projects mentioned above - Drawing portfolio and model.

Building Construction and Materials-V

Subject Code	K8302	Semester-V
Credits	6	Subject type-Core

Learning Objectives	
1	To introduce construction of building components in Reinforced Cement Concrete.
2	To introduce water proofing, insulation & protection systems and their methods of construction
3	To explain the concept of curtain wall and its architectural relevance.

Learning outcomes: Student will be able to	
1	Understand different foundation systems with respect to site and building character
2	Explore special construction techniques of curtain wall and design integration.
3	Become knowledgeable of alternative building materials used in construction

Units	Contents
Unit I	Foundation : <ul style="list-style-type: none"> - Concept of bulb of pressure and its significance for site investigation. - Introduction to relevance of soil mechanics in foundation design - Soil types & its behavior under different loading conditions
Unit II	Types Of Foundation <ul style="list-style-type: none"> - Mass concrete strip foundation. - Foundation for brick piers, entrance steps, compound walls etc. - Foundation on sloping site. - Foundation for point load. - Isolated R.C.C. footing for columns - Combined R.C.C. footing - Cantilever R.C.C .footing & eccentric footing - Foundation on weak strata. - Raft Foundation. - Pile Foundation
Unit III	Foundation and D.P.C. <ul style="list-style-type: none"> - Damp proof course treatment using rigid & flexible treatment - Brick on edge - Rough Shahabad stone - Bitumen sheets
Unit IV	Misc. Constructions : <ul style="list-style-type: none"> - Construction Details of Curtain Walls and Structural Glazing Including External Fixing and Cladding Details. Special Construction: <ul style="list-style-type: none"> - Basement Construction, Water Proofing details, etc. (Sketches, notes etc.) - Shoring and Underpinning - Flying, raking & dead shoring - Wall, Jack and mega pile, needle & pile, column underpinning

Unit V	Study of Materials <ul style="list-style-type: none"> - R.C.C. end connection details.(beam and column. Slab and beam etc.) - Reinforcement. - Fly ash brick, Stabilized earth block, Rammed earth block, Ferrocete, Concrete debri block. - Timbering & shuttering for French excavation - Glass
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Learning Resources	
Text Books:	1. M.S.Shetty(1986) <i>Concrete Technology</i> New Delhi, S.Chand&Co.ltd.
Reference Books:	1. J. S. Foster, Roger Greeno(2007). <i>Mitchell's Structure & Fabric: Part 2</i> .New York,Taylor and Francis group. 2. Mörsch, Emil (1909). <i>Concrete-steel Construction(Der Eisenbetonbau)</i> .New York, The Engineering News Publishing Company.
Websites:	www.slideshare.net/mvm2594/concrete-technology-12587295
Journals:	Journal of construction engineering, technology stmjournals.com/index.php?journal=jocetm Master builder -construction magazine, construction news(www.masterbuilder.co.in)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation. (min.4drgs.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different design in aluminum door and window for prescribed projects. (Under discretion of the subject faculty).

Theory of Structure -V

Subject Code	K8303	Semester-V
Credits	2	Subject type-Core

Learning Objectives	
1	To understand basic structural concepts in steel design.
2	To understand behavior of steel as a structural materials.
3	To understand fundamentals of steel structure.

Learning Outcomes: Student will be able to	
1	Develop understanding of basic requirements of steel structure
2	Develop understanding of behavior of use of steel structures
3	Explain importance of types of steel connections and jointing

Units	Contents
	Steel design (working stress and limit state both are acceptable – IS: 800)
Unit I	Sloping roof system - truss, loads acting on truss, design of purlin (working stress or limit state both shall be acceptable), analysis of truss using method of joints, identifying ties and struts, design of tension and compression members.
Unit II	Connections - Riveted, welded bolted connections, their strength. Explain single and double shear (no calculations, no zigzag riveting). Finding length of weld and arranging it along member edges
Unit III	Design of steel beams
Unit IV	Design of steel columns - (Compression members) single and built in (Introducing lacing and battening. No calculations for lacing and battening design) - Introduction to masonry structures and timber structural members. (no numericals)

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Negi L.S (2008)<i>Design of Steel Structures</i>.New Delhi,Tata McGraw-Hill Publishing company limited. 2. Bhavikatti S.S.(2009)<i>Design of Steel Structures</i>.I.K. International publishing house. 3. Vazirani V. N. &Ratwani M. M. &Mehra H.(2012)<i>Analysis and Design of Steel Structures</i>.New Delhi,Khanna Publishers.
Reference Books:	<ol style="list-style-type: none"> 1. Mckay J.K.<i>The construction of buildings, vol- IV, 4th ed. (metric), preparations steel RCC fire protection.</i> 2. Ed Ownens, G.W. Knowles,P.R. Dowling. <i>Steel designers manual Vththe steel construction institute.</i> 3. Iyengar K.T.S.&Viswanathan C.S.(2003)<i>Torsteel design handbook for reinforced concrete members with limit state design</i>.New Delhi,Tata McGraw-Hill Publishing company limited. 4. Negi L.S.(2002)<i>Design of steel structures 2nd ed</i>.NewDelhi,Tata McGraw-Hill Publishing company limited. 5. Karve S.R. & Shah V. L.(2014)<i>Structural design databook steel structures according to IS 800-1984</i>.Pune,Structures Publication.

	<p>6. Vazirani V. N. &Ratwani M. M. &Mehra H. (2012)<i>Steel structure design and analysis</i>.New Delhi,Khanna Publishers.</p> <p>7. Habermann S.S.<i>Steel construction manual</i>.International Certification.</p> <p>8. AISC<i>Seismic provisions for structural steel buildings april 15th 1997</i>.American society of plant physiologists.</p> <p>9. RamamruthamS.&Narayanan R.(1997)<i>Design of steel structure</i>.New Delhi,Dhanpat Rai Publishing.</p>
Websites:	www.bis.org.in
Journals:	IS 800-2007

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Design of an industrial building, show column locations for given plan area, determine type of truss, design of purlin, purlin-truss connection detail, analysis of any three joints of truss, design of tension member with rivet/weld/bolt, design of compression member, design of columns (built in) supporting the trusses. Drawings and schedule

Working Drawing-I

Subject Code	K8304	Semester -V
Credits	5	Subject type-Core

Learning Objectives	
1	To understand and prepare working drawings necessary for construction/execution of buildings on site.
2	To make student understand how to read “Working drawings” on site

Learning Outcomes: Students will be able to	
1	Prepare working drawings for load bearing structure.
2	Prepare Detailed drawings such as doors, windows, toilets, kitchen, flooring etc.
3	Prepare drawing which are readable for all agencies which are involved in execution of the project.

Units	Contents
Unit I	Introduction to WD, their significance, study of Example of Working Drawings, site visit
Unit II	Translating design into working drawing of entire project.
Unit III	Drawing showing construction details.
Unit IV	Details of toilets, doors, windows etc

Learning Resources	
Text Books:	
Reference Books:	1. Wakita, Osamu A., Richard M. Linde, and Nagy R. Bakhom (2011). "The Professional Practice Of Architectural Working Drawings" 2. Drawings from ISO certified architect office
Websites:	
Journals:	Gawne, Eleanor. "Cataloguing architectural drawings." Journal of the Society of Archivists 24.2 (2003): 175-187

Assessment	Marks
I.A.	40
Internal Assessment	
	Refer To ‘Rule number 6, sub point 6.2.2.’
U.E.	60
University Examination	
	Assignments or portfolios based on entire syllabus as mentioned below.

Assignments	
1	Site visit report, Common project assignment.
2	Assignment of Time bound working studio assignment.
3	A portfolio of working drawings where student selects their own design.

History of Architecture-IV

Subject Code	K8305	Semester -V
Credits	3	Subject type-Core

Learning Objectives	
1	To introduce the idea of modernity and demonstrate its impact in the realm of Architecture.
2	To study modern architecture as evolving from specific aspects of modernity industrialization, urbanization, material development, modern art.
3	To study in detail different post modern and contemporary directions in World Architecture
4	To study quest for Indianness in architecture of India from the end of colonial rule to contemporary period

Learning Outcomes: student will be able to	
1	Acquire knowledge of the development of architectural form with reference to technology, materials, style and character of the decades of modernism, post modernism and contemporary architecture and architects.
2	Obtain an overall understanding of the architectural developments of Architecture of post-colonial India

Units	Contents
Unit I	<p>Modernism</p> <ul style="list-style-type: none"> - Introduction to Modern Architecture. <p>Isms in Art and Architecture</p> <ul style="list-style-type: none"> - Adolf Loos and critique of ornamentation- Raumplan: Peter Behrens-Werkbund. Expressionism: Mendelsohn, Taut, Polzeig- Futurism- Constructivism, Cubism-Suprematism- De-Stijl. Bauhaus- Gropius, Meyer and Mies. Bauhaus School, Chicago School of Architecture and Taliesin School of Architecture – Great masters like Louis Sullivan, Frank Lloyd Wright <p>International Style</p> <ul style="list-style-type: none"> - Post WW II developments and spread of international style –works of Corbusier:- Brasilia, Unite - Works of later modernists: Louis Kahn, Paul Rudolph, Eero Saarinen, Philip Johnson
Unit II	<p>Post Modernism</p> <ul style="list-style-type: none"> - Critiquing Modernism - Brutalism- projects of Smithsons and Aldo Van Eyck – writing of Jane Jacobs, Robert Venturi, Aldo Rossi and Christopher Alexander - Deconstructivism –Critical regionalism - Innovation and ideas of Archigram – post modern architects like Peter Cook, Paolo Soleri, Robert Venturi - Contemporary architects: Norman Foster, Richard Rogers, James Sterling, Peter Eisenman, Renzo Piano, Daniel leibskind, Zahahadid, Frank O Gehry, Santiago Calatrava, , Rem koolhaas
Unit III	<p>Post Colonial Architecture in India and any two examples across the globe</p> <ul style="list-style-type: none"> - Architectural debates associated with nation formation– early modernist architecture-

	- Post-independence city planning: Chandigarh and Bhuvanesar- influences on post-independence architects- Architecture of Kanvinde, Raje, Doshi, Correa, Nari Gandhi, Raj Rewal.
Unit IV	Master Architects influenced by Vernacular/Regional Architecture of India

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Kenneth Frampton, (1994) <i>Modern Architecture: A Critical History</i>. London, Thames & Hudson. 2. Kenneth Frampton, Richard Ingersoll, (2000) <i>World Architecture-A Critical Mosaic 1900-2000 Vol 1</i>. New York, China Architecture and Building Press. 3. Manfredo Tafuri, (1980) <i>Modern Architecture</i>. New York, Harry N. Abrams Inc. 4. William Jr. Curtis, (1988) Balkrishna Doshi, <i>An Architecture for India</i>. New York, Rizzoli Publication. James Steele, (1985) <i>Hassan Fathy</i>. London, Academy Editions. 5. Sandra Forty, (2004) <i>Architecture</i>. Rochester, Grange books 6. Andreas C. Papadakis (1991) <i>A spirit in Architecture</i>, London
Websites:	www.historiasztuki.com.pl/ARCHWSP-POSTMODERNIZ www.modern-architect.com http://www.quora.com/What-are-the-main-differences-of-modern-and-post-modern-architecture http://www.arthistoryarchive.com/arthistory/architecture/Architecture-UrbanCactus.html
Journals:	JSAH-Society of Architectural Historians (www.sah.org/publications-and-research/jsah) Architectural Heritage-Edinburgh University Press(www.euppublishing.com/journal/arch)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
Note	Based on the Assignments listed below with continuous assessment and attendance scrutiny. The final presentation in standard specified Portfolio with all written reports and graphical representations (sketches, pictures)
1	Analytical study of Post-Colonial Architecture in India with literature survey
2	Power point Presentation and discussion of Modern, Post modern, Contemporary World Architects with references to their styles, designs, technologies, materials and directions
3	Critical Analysis through book /literature survey of various architects and their buildings with relevance to vernacular architecture of India
4	Report based on field study.
5	Model making.

Specification Writing

Subject Code	K8306	Semester -V
Credits	2	Subject type-Core

Learning Objectives	
1	To develop skill of writing specifications for materials and works.

Learning Outcomes: students will be able to	
1	Write specifications with reference to building trades, materials, workmanship and performance of different items of work
2	Discuss specifications as integral part of contract document for building projects

Units	Contents
Unit I	<ul style="list-style-type: none"> - Specifications as part of contract document, definition, need and importance, its relationship with working drawings, bill of quantities and Schedule of rates. - Types of specifications, open, closed, restricted, prescriptive, performance based, or combination of above types. Use of manufacturers guide etc. - Specification writing method to include master list, sectional formats, page formats, general material items, tests, performance, mode of measurements etc
Unit II	<ul style="list-style-type: none"> - Methodology of writing detailed specifications including methods and forms of writing descriptive notes on materials and workmanship based on working drawings. - Collection of catalogues and technical information on various materials, products and specialized items. - Preparation of checklist for writing detailed specifications
Unit III	<ul style="list-style-type: none"> - Study of different building trades, their scope and contents. - Introduction to writing specifications for building services and checklist for services such as Water Supply, Drainage, Electrical and HVAC installations. - Writing specifications of a previous design project in full or part as final assignment

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. S. Patil (2013) <i>Civil Engineering Contracts and Estimate</i>. Anand. Orient Blackswan, Bangalore 2. B.N.Datta (2011) <i>Estimation and Quantity Surveying</i>, UBS Publishers & Distributors Ltd. Mumbai.
Reference Books:	<ol style="list-style-type: none"> 1. SP 27 (1987) <i>Handbook of Method of Measurement of Buildings Works</i>, Bureau of Indian Standards (BIS) 2. [CED 44: <i>Methods of Measurement of Works of Civil Engineering</i>] (first revision-2003) Bureau of India Standards. 3. Willis, C. & A. Willis (1997) <i>Specification writing for architects and surveyors</i>, Blackwell Science, United Kingdom
Websites:	www.training@theNBS.com(National Building Specifications) www.ncarb.org
Journals:	National Council of Architectural Registration Boards(N.C.A.R.B) - See more at: http://www.ncarb.org/en/About-NCARB.aspx#sthash.bpyDoY2q.dpuf International Cost Estimating and Analysis Association (ICEAA)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper.	

Building Services-III

Subject Code	K8307	Semester -V
Credits	2	Subject type-Core

Learning Objectives	
1	To expose students to the science behind HVAC system.
2	To familiarize students with the various air- conditioning systems and their applications
3	To study various aspects of Natural Ventilation

Learning Outcomes: student will be able to	
1	Acquire knowledge of various air conditioning systems and their applications.
2	Address various issues in design of HVAC system
3	Understand various issues in natural ventilation systems in buildings

Units	Contents
Unit I	HVAC <ul style="list-style-type: none"> - Air distribution systems, ducts and ducting layout. - Costing data and space requirements. Integration of AC systems in Design. - Principles of Psychometrics and heat transfer
Unit II	Components of HVAC <ul style="list-style-type: none"> - Unit AC's, Central AC's split AC's. - Components of AC system such as chilling plant, cooling towers, air handling units, calculation of AC load. - Water consumption for AC
Unit III	Ventilation of buildings <ul style="list-style-type: none"> - Natural ventilation (passive.) - Ventilation functions and requirements. - Physical mechanism of ventilation. - Design factors affecting ventilation
Unit IV	Mechanical ventilation (active) <ul style="list-style-type: none"> - Need of mechanical ventilation <ul style="list-style-type: none"> a) Forced ventilation – Exhaust fans, Axial flow fans, Blowers for industrial ventilation. b) Introduction to Air conditioning, heating and cooling

Learning Resources	
Text Books:	1. Benjamin Stein and John Renolds.(2006) <i>Mechanical and Electrical Equipment for Building</i> , New York, John Wiley and Sons.
Reference Books:	1. Vasisth K.(2011) <i>Waste management</i> New Delhi, Essential books. 2. National Building Code of India, 2005 (NBC 2005)
Websites:	http://bst1.cityu.edu.hk/e-learning/
Journals:	Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE-(www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Elective- III

Subject Code	K8308	Semester IV
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes: Student will be able to	
1	Engage in systematic self study of topic they feel interested in.

Students can select one elective from the following list	
1	<p>Barrier Free Architecture</p> <ul style="list-style-type: none"> - Types of disabilities and its implications in Architecture, barrier free environment, access- provisions to facilities and amenities. - Typical barrier problems of the physically challenged people-parking, approaches to buildings travel within buildings etc. - Special design considerations in residential buildings, congregational buildings like auditoriums, theatres, studios, transport terminals etc, Institutional buildings, outdoor appurtenances, garden – parks etc. - Study of norms set by Central Government
2	<p>Appropriate technology</p> <ul style="list-style-type: none"> - Introduction to the concept of Appropriate technology and services suitable in Indian context for both rural and urban application - Study of theoretical and practical aspects of innovative /alternative materials and construction techniques developed in recent past. - Mud wall, suitability of soil for mud walls - Waffle and daub walls, Rammed earth walls, adobe walls - Walls, vaults using soil cement, compressed mud blocks, Nubian arch roof - Use of Bamboo as material its properties ,available in country - Burnt clay tile roofing, ferro cement roofing units, doubly curved tile roofing
3	<p>Contemporary Design Theory(History and Design)</p> <ul style="list-style-type: none"> - Detail study and analysis of styles of contemporary Indian and foreign Architects - Study of spatial order, structural, constructional and material order, manner of articulation, symbols, and meanings as these evolved in time and space. - Comparative study of building typologies in vernacular and architecture in modern period
4	<p>Seminar II</p> <ul style="list-style-type: none"> - Independent study and documentation of architectural and allied subjects by individual student alongwith oral and visual presentation. - The seminar shall be a research paper on a topic related to Architecture

Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – VI

Architectural Design -VI

Subject Code	K8309	Semester -VI
Credits	8	Subject type-Core

Learning Objectives	
1	To explore and demonstrate ‘technology and services as major determinants of Architectural form’ and understand co-relation between function, structure, services and form.

Learning Outcomes: Student will be able to	
1	Develop analytical skill set for understanding built and non-built spaces
2	Synthesize and translate the analytical understanding into Architectural Design

Units	Contents
Unit I	Research and Analysis of innovative technologies and materials prevailing in market, state of the art services and systems.
Unit II	Multi-functional public buildings like IT Complex, Hospitals, Commercial Centers, High Rise Structures
Unit III	Extension of the large project mentioned above e.g. Design of gymnasium, bank, departmental store, operation theatre, auditorium, etc.

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Bhatt V. & Seniver P., (1990), <i>Contemporary Indian Architecture: After The Masters</i>, Ahmedabad, USA, Mapin Publishing Pvt. LTD. 2. Kanvinde A. P. & Miller J. H., (1969), <i>Campus Design in India: Experience of a Developing Nation</i>, Jostens/American Yearbook Company 3. Mehta J., (2011) <i>Rethinking Modernity</i>, New Delhi, India, Niyogi Books 4. Pressman A., <i>Design Architecture the elements of Process</i>, USA, Routledge 5. Pandya Y., (2005) <i>Concepts of Space in Traditional Indian Architecture</i>, India, New Jersey, Mapin Publishing. 6. Salvadori M., & Robert H., (1975), <i>Structure in architecture: the building of buildings</i>, Cornell University, Prentice-Hall 7. Steele J., Doshi B.V., (1998) <i>The complete architecture of Balkrishna Doshi: rethinking modernism for the developing world</i>, India, Super Book House 8. Unwin S. (4th Ed), <i>Analysing Architecture</i>, Canada, Routledge
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Design project demonstrating integration of the building components and

	technology, services, vertical circulation, byelaws etc. on any one of the following – 3-star hotel, commercial complex, hospital, civic center, convention centre etc – Drawing portfolio and models
2	Design Project on any one of the following – gymnasium, bank, departmental store, operation theatre, auditorium, etc. - Drawing portfolio and models

Building Construction and Materials-VI

Subject Code	K8310	Semester -VI
Credits	6	Subject type-Core

Learning Objectives	
1	To introduce construction of building components in Reinforced Cement Concrete.
2	To introduce construction of building components in steel and its use in industrial construction
3	To introduce methods of the pre-engineered structures

Learning Outcomes: student will be able to	
1	Explore different R.C.C components of framed construction as well as special component construction.
2	Discuss different steel components and its construction
3	Understand concept of pre-engineered construction with respect to industrial construction

Units	Contents
Unit I	R.C.C. Framed Construction Element study <ul style="list-style-type: none"> - Principles and practices of R. C. Framed construction and its components - R. C. C. Footing for column, Isolated footing - R. C. C. Plinth beams and Plinth formation - R. C. C. Lintels and Chajja projections - R. C. C. Slab – one way, two way, single span and continuous spans - R. C. C. Beams – singly and doubly reinforced, single and continuous spans, cantilever beams - R. C. C. Columns
Unit II	R.C.C. Framed Construction Special Component study <ul style="list-style-type: none"> - R.C.C., Balconies, Canopies, fins, parapets - R.C.C. its potential and application - Details of junctions of slab and beam, slab-beam- column, primary, secondary beams - Study of form work construction - R.C.C. Staircase
Unit III	Steel Structures <ul style="list-style-type: none"> - Study of portal frames, its various types & connection details. - Study of Castellated Beam, Veradale girder, Portal Frames & Lattice Construction with Connection details. - Medium span Roof Trusses with Sheet Cladding details & Rain Water Disposal details. - Introduction to framed steel structures using steel sections & steel decking
Unit IV	Industrial Building: <ul style="list-style-type: none"> - Study of constructional details for industrial buildings. - Details for lighting, Ventilation & Rain water disposal for industrial buildings. - Study of Machine foundation, gantry & high Strength flooring etc
Unit V	Study of Materials

	<ul style="list-style-type: none"> - Different cladding materials with fixing details. - Pre engineered structures. - Pre-stressed and post-tensioning methods pros and cons.
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Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. M.S.Shetty(1986)<i>Concrete Technology</i> New Delhi, S.Chand&Co.ltd. 2. J. S. Foster, Roger Greeno(2007)<i>Mitchell's Structure & Fabric: Part 2</i>.New York,Taylor and Francis group.
Reference Books:	<ol style="list-style-type: none"> 1. Gorenc, Tinyou, Syam(2005)<i>Steel Desinger's Handbook</i>. New Delhi,CBS Publishers and Distributors. 2. Ralph Monletta(1989)<i>Plastics in Architecture" – A guide to acrylic and Polycarbonate</i>.New York, Marcel Dekker Inc. 3. Jack M Landers(1983)<i>Construction Materials, Methods, Careers</i> USA,Good Heart - WilCox Company,Inc Publishers, Homewood, IL.
Websites:	www.slideshare.net/mvm2594/concrete-technology-12587295
Journals:	Journal of Construction Engineering, Technology stmjournals.com/index.php?journal=jocetm) Master Builder -Construction Magazine, construction News(www.masterbuilder.co.in)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation. (min.4drgs.)
2	Field reports and Market survey of building technology topics.
3	Proposals of different design in industrial building for prescribed projects. (Under discretion of the subject faculty).

Theory of Structures-VI

Subject Code	K8311	Semester -IV
Credits	2	Subject type-Core

Learning Objectives	
1	To understand basic concepts for RCC foundations
2	To understand behavior of different soils and foundation choice
3	To understand different types of RCC footings

Learning Outcomes: student will be able to	
1	develop understanding of basic staircase design.
2	develop understanding of behaviour of footings
3	understand importance of prestressing structural elements

Units	Contents
Unit I	Staircases - Types based on supports, loads, design of simply supported doglegged staircase
Unit II	Soil types and foundations - Soil types and determining suitable foundation (only theory) : safe bearing capacity, shear failure, excessive settlement, differential settlement, trial pits, need of pile foundation, need of raft foundation. - Design of rcc isolated pad footing. Explain (not design)rcc details of isolated circular and sloped footing, eccentric footing. - Necessity of combined footing, behaviour of combined footing, rcc details. (no design problem)
Unit III	Foundation for steel columns - Theory.(no numerical)
Unit IV	Prestressing - Introduction to prestressed structural elements, procedures, advantages, disadvantages, simple numerical beam problem to explain the concept of prestressing

Learning Resources	
Text Books:	1. Shah H.J. (2014) <i>Design of RCC structures part II</i> . Anand, Charotar publishing house.
Reference Books:	1. Dr.Shah V.L.& Dr. Karve S.R.(2014) <i>RCC Theory and Design</i> .Pune,Structures Publishers. 2. Shah H.J.(2013) <i>Design of Reinforced Concrete Structures</i> .Anand,Charotar Publishing house. 3. Sinha S.N.(2014) <i>Reinforced Concrete Design</i> .New Delhi,Tata McGraw-Hill Publishing company limited.
Websites:	www.bis.org.in www.nptel.ac.in
Journals:	IS: 456-2000 code of practice for plain and reinforced concrete SP:16-Design aids for reinforced concrete

Assessment	Marks
I.A.	Internal Assessment
	40

	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Design of simply supported doglegged stair case, drawing and schedule
2	Design of isolated pad footing, drawing and schedule
3	Making a typical RCC structural drawing with column location, numbering, beams (identifying beams to be designed as simple/cantilever/continuous...slabs to be identified as one way/two way/cantilever/continuous...typical detail of each element and schedule – no design)
4	Photo documentation of various foundation problems and their solutions

Working Drawings -II

Subject Code	K8312	Semester -VI
Credits	4	Subject type-Core

Learning Objectives	
1	To understand and prepare advanced drawings necessary for construction/ execution of the buildings on site

Learning Outcomes: Student will be able to	
1	Prepare working drawings for RCC Framed structure
2	Prepare Detailed drawings such as OHWT, staircase, electrical layout, toilet details
3	Ability to coordinate with other consulting agencies involved in the project.

Units	Contents
Unit I	Preparation of working drawing for RCC structure
Unit II	Details
Unit III	Fieldwork: Setting of structure on Site

Learning Resources	
Text Books:	
Reference Books:	1.Wakita, Osamu A., Richard M. Linde, and Nagy R. Bakhoum (2011). "The Professional Practice Of Architectural Working Drawings
Websites:	
Journals:	Gawne, Eleanor. "Cataloguing architectural drawings." Journal of the Society of Archivists 24.2 (2003): 175-187

Assessment	Marks
I.A.	Internal Assessment
	Refer To 'Rule number 6, sub point 6.2.2.'
U.E.	University Examination
	Assignments or portfolios based on entire syllabus as mentioned below.

Assignment	
1	Common project
2	Field assignments
3	Individual design translated to working drawing portfolio with all details necessary for construction.

Landscape Architecture

Subject Code	K8313	Semester -VI
Credits	3	Subject type-Core

Learning Objectives	
1	To emphasis learning of architecture beyond building, in the outdoor environment and spaces
2	To introduce the role and importance of landscaping and site planning in enhancing and improving the quality of building environs, functionally and aesthetically.
3	To explain site and its context while designing of buildings
4	To use landscape elements to create and enhance exterior spaces and to achieve climatic control at the buildings and site level.

Learning Outcomes: Students will be able to	
1	Explore various aspects of site planning and relationship between built and openspaces
2	Understand role of landscape in architecture.
3	Design small scale landscape project using landscape elements.

Units	
Unit I	<p>Introduction to landscape architecture – Importance, need and scope</p> <p>Landscape Elements</p> <ul style="list-style-type: none"> - Plant element: Different aspects of - trees, shrubs, lawns, climbers, hedges, Indoor plants as elements. Basic idea about plants, plant selection, planting design and care of plants. Importance and use of NATIVE vegetation - Land element: Different aspects –soils, topography, levels, grading, earth forms, and foundations. - Water elements: Fountains, waterfalls, pools, cascades, channels, irrigation etc. - Architectural elements: sculptures, curbs, walls, steps, fence, etc
Unit II	<p>Historical and contemporary landscape practices and case studies</p> <p>Integration of indoor and outdoor spaces</p>
Unit III	<p>Climate</p> <ul style="list-style-type: none"> - Macro and microclimatic consideration in landscaping; effect on landscape and microclimate <p>Site analysis and planning</p> <ul style="list-style-type: none"> - Methodology and process of site study. Landform analysis, site analysis techniques. Importance of site planning for landscape design and architecture. <p>Principles of landscape design</p> <ul style="list-style-type: none"> - Aesthetical consideration
Unit IV	<p>Relation between built and open spaces</p> <p>Pedestrian and vehicular circulation</p> <p>Landscape construction details</p> <p>Services related to landscape</p> <ul style="list-style-type: none"> - Plumbing, water supply, electrical, sewage management

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Jellicoe, G. A., & Jellicoe, S. (1982). <i>The Landscape of Man: Shaping the Environment from Prehistory to the Present Day</i>: Van Nostrand Reinhold. 2. Simonds, J. O. (1998). <i>Landscape Architecture: A Manual of Site Planning and Design</i>: McGraw-Hill. 3. Booth, N. K., & Hiss, J. E. (2012). <i>Residential Landscape Architecture: Design Process for the Private Residence</i>: Prentice Hall. 4. Reid, G. W. (2007). <i>From Concept to Form in Landscape Design</i>: Wiley. 5. Robinette, G. O. (Ed.). (1983). <i>Landscape Planning for Energy Conservation</i>. NewYork: Van Nostrand Reinhold Company. 6. White, S., & Stein, J. A. (1993). <i>Building in the garden: the architecture of Joseph Allen Stein in India and California</i>: Oxford University Press. 7. Kanvinde, A., & Miller, H. J. (1969). <i>Campus Design in India: Experience of a Developing Nation</i>: Jostens/American Yearbook Company. 8. Lynch, K. (1984). <i>Site Planning</i> (Third ed.): M.I.T. Press
Websites:	
Journals:	Journal of landscape Architecture (LA)

Assessment	Marks
I.A.	Internal Assessment
	Refer To 'Rule number 6, sub point 6.2.2.'
U.E.	University Examination
	Assignments or portfolios based on entire syllabus as mentioned below.

Assignments	
1	Comprehensive landscape proposal(Drawing portfolio) <ol style="list-style-type: none"> a) One project for Functional and Aesthetic considerations, at residence level. (Especially landscape places like interiors, courtyards, terrace gardens, window landscaping etc.) b) One project for campus planning including vegetation, parking, road sections, footpaths, lighting etc.
2	Case studies of landscape project under consideration in the form of report

Estimation and Costing

Subject Code	K8314	Semester -VI
Credits	3	Subject type-Core

Learning Objectives	
1	To equip students with necessary technical knowledge for calculating estimates and detailed costing for small to medium projects with developing the skill of writing specifications for materials and item works.

Learning Outcomes: Students will be able to	
1	Compute quantities of various building items for simple load bearing structures and be acquainted with various types of Estimates including mode of measurements as adopted by I.S.1200.
2	Compute quantities and rate analysis of various building items of R.C.C. framed structure along with building services such as water supply, sanitation and drainage, electrical installations etc

Units	Contents
Unit I	Introduction, purpose of “Quantity Computation” i.e. estimating, types of estimates (preliminary, Detailed) - Study of I.S.-1200. - A small project in load bearing and R.C.C. frame construction or their part to work out quantities and to understand market rate of materials and labours.
Unit II	- Bill of quantities for single story structures - Load bearing construction system. - R.C.C. Frame construction system.
Unit III	- Methods of calculating quantities for building works - Preparation of Bill of Quantities (B.O.Q.) Mode of measurements of quantities. Market rates of labour and building materials. Labour requirement and norms for consumption of basic materials. - Schedule of rates
Unit IV	- Study of different agencies involved in construction e.g. CPWD, PWD, etc. - Rate analysis and cost index. - Study of rate of innovative building materials in the market. - General factors affecting the rate of an item .rate analysis for different components of construction. - Software for calculation of quantities of various building items

Learning Resources	
Text Books:	1. B. S. Patil(2006). Civil Engineering Contracts and Estimates (Third Edition), Orient Blackswan. 2. B.N.Datta, (2011) Estimation and quantity surveying
Reference Books:	1. SP 27 (1987): Handbook of Method of Measurement of 2. Buildings Works [CED 44: Methods of Measurement of Works of 3. Civil Engineering] (first revision-2003) Bureau of India Standards 4. Arthur J.Willls (1979). Specification writings for Architects and surveyor by. Published by Crosby Lockwood 5. National Building Code(N.B.C.)2005,Bureau of India Standards
Websites:	www.bdg.org. WDBG- National Institute of Sciences.(Cost Estimating)

	<i>www.cost -estimating.com</i>
Journals:	Specifications Consultants in Independent Practice (SCIP) International Cost Estimating and Analysis Association (ICEAA)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Assignments	
	Exercises for IA
1	To work out the quantities of a small load bearing structure having area not more than 40 sqm.
2	To work out the quantities of items of construction work of load bearing and R.C.C. framed structure along with presentation
3	To prepare the list of items in construction and work out the quantities of items as directed by instructor

Building Services-IV

Subject Code	K8315	Semester -VI
Credits	2	Subject type-Core

Learning Objectives	
1	To study different high rise systems with respect to service core designs and building automation systems.
2	To familiarize the students with firefighting equipment and their installation
3	To familiarize students with water supply and sanitation systems in high rise
4	To study various aspects of vertical communication systems.

Learning Outcomes: Student will be able to	
1	Explore various services including core and building automation systems.
2	Understand fire safety, fire fighting, fire prevention and installations in buildings including codal requirements
3	Address various design issues of water supply and sanitation systems in high rise buildings.
4	Understand various systems of vertical communication

Units	Contents
Unit I	Advanced Building Services - Types of High Rise Buildings - Building Core Arrangements
Unit II	- Water distribution systems in High rise buildings- downfeed water distribution, pumped upfeed distribution, constant pressure upfeed, gravity downfeed system - Sanitation systems in High rise buildings- two pipe system, solvent system.
Unit III	- Vertical communication systems for high rise buildings-Types of Elevators, Sky lobby Elevator system, double- deck elevator system, Hydraulic Elevators
Unit IV	- Fire fighting in high rise buildings- Water fire suppression systems and other fire suppression systems, Fire detection systems - Codal provision and standards for Fire fighting
Unit V	- Building automation system

Learning Resources	
Text Books:	1. Benjamin Stein and John Renolds.(2006) <i>Mechanical and Electrical Equipment for Building</i> , New York, John Wiley and Sons.
Reference Books:	1. "Fire Safety: National Building Code of India 1983" published by Bureau of Indian Standards. 2. Andrew H Buchanan, (2001) <i>Design for fire safety</i> .New York,John Wiley & Sons Ltd 3. Yeang K.(2002) <i>Service cores details in building</i> . New York, John Wiley and sons. 4. National Building Code of India, 2005 (NBC 2005)
Websites:	http://www.slideshare.net/rdpatil65/fire-fighting-presentation http://www.powershow.com

Journals:	Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE-(www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)
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Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Elective-IV

Subject Code	K8316	Semester IV
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes; student will be able to	
1	Engage in systematic self study of topics they feel interested in.

Students can select one elective from the following list	
1	Architectural Journalism <ul style="list-style-type: none"> - Structure of architecture Journals - Writing Descriptive and analytical reports - Editing write ups, Photo Journalism. - Book reviews - Page compositions - The public process - Electronic media
2	Theatre /Film set Design <ul style="list-style-type: none"> - History of set and backdrop design for performance - Theme based design strategies - Period and modern sets, Technology applications
3	Green material/advanced material <ul style="list-style-type: none"> - Green material Selection, factors in selection, Resources to assist in determining materials appropriateness. - Material consideration when using the LEED rating program - Finishing materials for interior and exterior - Insulating materials :organic binders and bitumen and tar based materials like Bitumen, tar, emulsions, mastics, waterproofing items - Polymer sand polymer –based materials and components, polymer based building material for walls, pipes, sanitary-ware, glues and mastics - Metals in advanced building systems, steel cables, structural glazing and curtain walling - Light weight roofing materials :asbestos, galvanized iron, acrylic, polycarbonate
4	Visual Communication <ul style="list-style-type: none"> - Visual communication in architecture - Non verbal communication –signs, symbols, metaphor. - General concepts of image and schema - Concept sketches, bubble Diagrams, Area Diagram - Exploring methods of presentation for design through photographs, ppt, sketching, rendering etc. - Built forms and environment, Way finding in architecture and space between environment

Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – VII

Architectural Design -VII

Subject Code	K8401	Semester -VII
Credits	10	Subject type-Core

Learning Objectives	
1	To learn different visual mapping methods in architecture
2	To understand and analyze the urban context and respond through design of a public space /public building

Learning Outcomes: Student will be able to	
1	Learn methods of mapping data
2	Develop analytical skills responsive to the broader socio-economic & physical context of the study area
3	Synthesize and translate analytical understanding into Architectural Design

Units	Contents
Unit I	Data Collection, Representation <ul style="list-style-type: none"> - Learning different methods of data collection, documentation and representation through mapping - Documenting the socio-economic & physical context of the study area, understanding character and distinctive features of the same. - Understanding of the legislative provisions including land-use, zoning, DCR& relevant acts as applicable to the study area.
Unit II	Data Analysis <ul style="list-style-type: none"> - Analyzing the available data to arrive at issues, concerns and design decisions based on methods like SWOT analysis. - Arriving at a design proposal and developing design brief based on the analysis
Unit III	Design Proposal <ul style="list-style-type: none"> - Design of a public space/building responsive to the context - site and people

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Alexander C., Ishikaw S., Silverstein M. & Jacobson, <i>A Pattern Language, Town, Buildings, Construction</i>, Oxford University Press 2. Alexander C., Ishikaw S., Silverstein M. & Jacobson, <i>A Timeless way of Buildings</i>, Oxford University Press 3. Bacon E. N., (1976), <i>Design of Cities</i> Revised Edition, USA, Penguin Books 4. Jain K. B., (2011), <i>Architecture Conceptual to the Manifest</i> 5. Lang J., (1994) <i>Urban Design: The American experience</i>, John Wiley & Sons, 6. Cullen G., (1971), <i>The Concise Townscape</i>, New York, USA, Architectural Press, Routledge. 7. Lang J. T. , Desai M. & Desai Madhavi, (1997) <i>Architecture and independence: the search for identity--India 1880 to 1980</i>, USA, Oxford University Press 8. Lynch K., (1960, 1990), <i>The Image of the City</i>, Massachusetts Institute of Technology Cambridge, Massachusetts, and London, England, The M.I.T. Press (20th Printime)

Websites:	Atre S., <i>Comprehensive Architecture + Urban Design Studio, Architecture And Context</i> California Polytechnic State University, San Luis Obispo College of Architecture & Environmental Design, From http://www.calpoly.edu/~arch/program/fifthyr/atre.pdf
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment	
1	Data collection and analysis of urban fabric of selected site
2	Site responsive design demonstration of the following building typologies may be encouraged — residential, industrial, museums, libraries, transportation, institutional, hospitality buildings, recreational, any public activity spaces, etc. - Drawing portfolio and 3 - d model

Building Construction and Materials-VII

Subject Code	K8402	Semester-VII
Credits	4	Subject type-Core

Learning Objectives	
1	To introduce students to the advanced construction systems.
2	To introduce large scale roof constructions like stadiums, industrial buildings etc, and related materials.
3	To introduce types of swimming pool design and construction.
4	To introduce student to concepts of modular design and construction.

Learning outcomes: Student will be able to	
1	Understand various typologies and technologies of long span structures.
2	Understand various design and construction parameters of swimming pools.
3	Analyze modular concept of design and construction in large scale projects.
4	Explore sport stadiums, their field area and support space as well as building envelopes.

Units	Contents
Unit I	Long Span Structures <ul style="list-style-type: none"> • Shell structure like single curvature and double curvature etc. • Folded slab structure • Tension Structures like membrane, cable net and air supported etc. • Grid structure and skeletal like Space frames etc.
Unit II	Multi-basement <ul style="list-style-type: none"> - Soil bearing capacity and excavation techniques for basement. - Different uses of basement, it's planning criteria, Techniques of construction techniques like retaining wall, diaphragm wall, caissons, cofferdam etc. - Various services related to Basement like waterproofing, drainage, Ventilation, Ramps, elevators etc.
Unit III	Auditorium <ul style="list-style-type: none"> - Auditorium shape and size, seating arrangements. - Cone of vision, sightlines, stage and back stage design. - Acoustical design consideration, Noise and its criteria, sound defects etc. - Ancillary spaces like projection room, balcony, green rooms, orchestra pit etc. required for Auditorium. - Services related to Auditorium like fire protection and ventilation etc.
Unit IV	Modular coordination. <ul style="list-style-type: none"> • Precast and prefabricated building components used for roof, wall, interior and floor construction etc.
Unit V	Study of Materials <ul style="list-style-type: none"> - Study of modern building materials with respect to long span roof, modular system ,Acoustics ,basement etc.

Learning Resources	
Text Books:	1. T.D Ahuja and G.S. Birdie (1996) <i>Fundamentals of Building Construction</i> New Delhi, Dhanpat Rai Publishing Company Pvt. Ltd
Reference Books:	2. J. S. Foster, Roger Greeno(2007) <i>Mitchell's Structure & Fabric: Part 2.</i> New York,Taylor and Francis group. 3. Gorenc, Tinyou, Syam(2005) <i>Steel Designer's Handbook</i> New Delhi,CBS

	Publishers and Distributor. 4. Ralph Monletta (1989) <i>Plastics in Architecture</i> ” – A guide to acrylic and Polycarbonate. New York, Marcel Dekker Inc.
Websites:	http://roofhugger.com/ConstructionDetails.htm?utm_source=Come+See+Us+in+New+Orleans&utm_campaign=Hugger+News-January+2018&utm_medium=email`
Journals:	Journal of Construction Engineering, Technology stmjournals.com/index.php?journal=jocetm) Master Builder -Construction Magazine, Construction News(www.masterbuilder.co.in)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2’	
U.E.	University Examination	60
	Theory paper	

Theory of Structures -VII

Subject Code	K8403	Semester-VII
Credits	2	Subject type-Core

Learning Objectives	
1	To understand trends and challenges in contemporary building structural systems.
2	To understand complex building structures and large spans
3	To understand importance and need for structural modeling

Learning Outcomes :Student will be able to	
1	Develop connections between Design, Construction and Material.
2	Design Ground and First floor structures with R.C.C. and steel building with simple configuration
3	Apply software as tool for modeling structures

Units	Contents
Unit I	<ul style="list-style-type: none"> - Earthquake zoning, base shear, lateral forces. Introduction to IS: 1893 - Introduction to shear wall, structural behaviour, typical details. - Ductile detailing: introduction to IS: 13920, typical details of beams, columns, junctions
Unit II	<ul style="list-style-type: none"> - Introduction to flat slab (beamless). Major structural actions, behaviour and RCC details. - Introduction to plate girders, gantry girders, castellated girders. - Introduction to flitched beams.
Unit III	<ul style="list-style-type: none"> - Introduction to shell roofs. Behaviour, structural actions and rcc details of spherical dome. - Understanding space frame and space truss (3D elements, equilibrium conditions and concepts only) - Introduction to long span structures: arches, open web sections, bow string girders, typical details. - Modelling and analysis of structure on STAAD-Pro software.

Learning Resources	
Text Books:	<ol style="list-style-type: none"> 1. Sarma T.S. (2014) <i>STAAD Pro V8i for Beginners with Indian Examples</i>. Chennai, Notion Press. 2. Shah H.J.(2014)<i>Design of RCC Structures part II</i>.Anand,Charotar Publishing house.
Reference Books:	<ol style="list-style-type: none"> 1. Dr.Shah V.L.& Dr. Karve S.R.(2014)<i>Illustrated design of reinforced concrete buildings(design of G+3 storeyed office/residential building)</i>.Pune,Structures Publishers. 2. Negi L.S.&Jangid R.S.(2000)<i>Structural analysis</i>.New Delhi,Tata McGraw-Hill Publishing company limited.
Websites:	<p>www.nicee.org www.bis.org www.nptel.ac.in INSDAG website</p>
Journals:	IS :1893 and IS: 13920

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment	
1	Sketching and explaining structural behaviour of above topics.
2	Case study of structural systems implemented by imminent architects in their projects
3	Modelling and analysis of simple structure on STAAD-Pro

Interior Design I

Subject Code	K8404	Semester -VII
Credits	4	Subject type-Core

Learning Objectives	
1	To make students understand various aspects of interior spaces
2	To make students understand qualities of interior spaces to develop skills in designing for functional and aesthetical meaningful interior spaces.

Learning Outcomes: Student will be able to	
1	Design interior spaces of buildings.
2	Design furniture with all necessary details.
3	Develop competence for working with various materials & construction techniques used in interior design

Units	Contents
Unit I	- Introduction to the field of interior design and various parameters. market survey of various interior materials
Unit II	- Market survey of various interior materials.
Unit III	- Case study of a small interior project. (100sq.m to 150 sq,m) Carpet area.
Unit IV	- A detailed design of the interior projects. (50sq.m to 100 sq,m) Carpet area.

Learning Resources	
Text Books:	1. John Coles & Naomi, (2007) The fundamentals of interior architecture/AVA Publishing SA.
Reference Books:	1. Mitcheil Beazley (2004), The new colour book/octopus publishing group ltd. 2. Julie Savill (2001), Good homes magazine(101 colour schemes that really works)/BBC World wide. 3. Elizabeth wilhide. (2007), Surface & Finish(Directory of materials for interiors) /Quadrille publishing Ltd. UK
Websites:	www.quadrille.co.in. www.theaid.in.
Journals:	Magazine published by IIID “Insite” International journal of interior architecture & spatial design.

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Study Example report with drawings & Studio based time bound Interior design project.
2	Report on survey of materials in market (This will be referred for UE examination)
3	Drawing portfolio comprising of Individual interior design layout, elevations,

	sections and views
4	Constructional drawing of various interior components and specification of the above interior finalized project.

Advance Landscape Architecture

Subject Code	K8405	Semester -VII
Credits	3	Subject type-Core

Learning Objectives	
1	To understand the complex issues related to landscape architecture and respond comprehending natural, man-made and social environment.
2	To understand various factors affecting landscape design at urban scale

Learning Outcomes: student will be able to	
1	Respond to complex issues related to landscape architecture at macro level
2	Understand influences of various factors on design of landscape at urban scale

Units	Contents
Unit I	Understanding advancements in Landscape Architecture -Terrace Gardens, Roof Gardens, Vertical Landscapes, etc. -Landscape for atriums -Innovative Landscape construction techniques.
Unit II	Understanding the process of site analysis and planning at macro level (involving complex issues such as physical, functional, environmental and socio-cultural) - Physical factors such as topography, geology, site features, hydrology, surrounding land-use, buildings and soil conditions - Environmental factors such as climate, existing flora and fauna - Socio-cultural such as existing use, structures of historic or religious importance if any , - Aesthetics such as views from and within site - Storm water management
Unit III	Understanding role of landscape for energy conservation -Role of vegetation -Role of water bodies -Role of land form -Effect on temperature, air movement, noise and pollution
Unit IV	Understanding the various factors affecting design and planning of urban open spaces and provide landscape solution for the same. - Physical Factor - Social Factors - Environmental Factors - Functional Aspects

Learning Resources	
Text Books:	-----
Reference Books:	<ol style="list-style-type: none"> 1. Jellicoe .G and Jellicoe. S (1987).The Landscape of Man, Thames and Hudson, London 2. Simonds. J. O. (1961). Landscape Architecture, The Shaping of Man's Natural Environment. F.W. Dodge Cooperation, London 3. Harris.C.W and Dine.N.T ; Time Saver Standards For Landscape Architecture, McGraw – Hill International Edition, Arch. Series

	<p>4. Starke .B and Simonds. J. O. (2013) Landscape Architecture: A Manual of Site Planning and Design. McGraw-Hill Professional</p> <p>5. Reid G. W: (1987) Landscape Graphics.</p> <p>6. Reid G. W: (1993) From Concept to Form: In Landscape Design. John Wiley & Sons .</p> <p>7. 7.Robinette, G.O (1977) Landscape planning for energy conservation. Environmental Design Press,Reston, VA</p>
Websites:	-----
Journals:	Journal of Landscape Architecture

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Case studies based on unit I
2	Assignment based on unit III
3	Case studies or readings based on unit IV
4	One large scale studio project based on unit II or IV

Urban Planning I

Subject Code	K8406	Semester -VII
Credits	3	Subject type-Core

Learning Objectives	
1	To introduce students to the basic concepts of Town and Urban Planning.
2	To understand the hierarchy of planning.
3	To understand the importance of Town Planning with respect to legislative guidelines, through Acts and Byelaws
4	To introduce the subject of Urban Design in order to enable students to establish a larger context for Architectural Design

Learning Outcomes: Student will be able to	
1	Understand the basic concepts of Town and Urban Planning
2	Legislation and rules of Town Planning
3	Do the Subdivision of Layout, and Municipal Drawings.
4	Understand the evolution of urban form of cities

Units	Contents
Unit I	Introduction to the subject of Urban Planning. Introduction to the Basic concepts in planning like landuse, zoning, byelaws etc Need and importance of study of Rural/ Town /Urban Planning for an architect.
Unit II	Evolution of planning in settlements from ancient to contemporary times. Principles, influences on Indus cities, Egyptian cities, Greek cities, Roman cities, Industrial cities etc.
Unit III	Planning Theories By Patrick Geddes; Kevin Lynch; Clarence Perry; Frank Lloyd Wright; Ebenezer Howard; Le Corbusier, C.A. Doxiadis, Lewis Mumford. Conceptual study of Garden city, Satellite towns, Industrial Towns, New Towns, Planned Cities, Twin Cities, Neighbourhood Etc. City plan patterns -Linear, Radial, Grid Iron layout and Ribbon development
Unit IV	Introduction to Housing and Housing Typologies Characteristics of Urban housing. Study of Housing typologies based on Topographical and Social, Economics aspects. Housing scenario and its impact. Study of Housing Neighbourhoods with reference to planning concepts and principles by planners.
Unit V	Introduction to Planning Legislation Introduction to various planning related laws, their contents and provisions, viz: M.R.T.P. Act of 1966, Land Acquisition Act of 1894, Maharashtra Slum Redevelopment Act, Urban Arts Commission Act, Municipal Act etc
Unit VI	Introduction to urban form and space Urban Form and space in historical and theoretical terms.

Learning Resources	
Text Books:	1. Kevin Lynch (1960) <i>The Image of the City</i> USA, MIT press. 2. Lewis Mumford (1972) <i>The City in History: Its Origins, Its Transformations, and Its Prospects.</i> USA, Harcourt, Inc.

	<p>3. Peter Geoffrey Hall (1996 Updated Edition) <i>Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century</i> USA, Blackwell publishing.</p> <p>4. Anthony J. Catanese, James C. Snyder (2014) <i>Urban Planning</i>. New Delhi, McGrawHill Education Private Limited.</p> <p>5. AbirBandyopadhyay, (2010) <i>Town Planning</i>, Kolkata, ArunabhaSen</p>
Reference Books:	<p>1. Brown A.J.(1969) <i>Introduction to town and country planning</i> Australia, Angus and Robertson publisher.</p> <p>2. P.Healey,(1981) <i>Planning Theory</i>.UK, Pergamon Press</p> <p>3. Arthur Gallion(1993)<i>The Urban Pattern</i>. New York, John Wiley and Sons</p>
Websites:	<p>www.planetizen.com/websites/2014 http://www.unhabitat.org/@UNHABITAT http://sustainablecitiescollective.com/@sustainablecities</p>
Journals:	<p>Cities: The International Journal of Urban Policy and Planning Urban Policy and Research Urban Studies</p>

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Building Services-V

Subject Code	K8407	Semester -VII
Credits	2	Subject type-Core

Learning Objectives	
1	To expose students to the various integrated services of water supply And drainage at campus level.
2	To familiarize students with solid waste management.
3	To study various Building Management Systems.

Learning Outcomes: student will be able to	
1	Acquire knowledge of various integrated building services.
2	Address various issues of solid waste management.
3	Understand various Building management systems

Units	Contents
Unit I	Water Distribution systems <ul style="list-style-type: none"> - For housing schemes and high rise buildings. Schematic water distribution from treatment plant to town, group housing etc. - Hot water supply in high rise buildings. - Water heaters, boilers - Solar water heating
Unit II	Sewage collection and disposal <ul style="list-style-type: none"> - For large campuses, complexes, High rise Buildings etc. Mechanical methods of removal of sewage from basements (Shone's ejector). - Sewage treatment, Waste water conservation, recycling, biogas etc
Unit III	Urban Drainage Systems <ul style="list-style-type: none"> - For private and public places. - Drainage ,sub drains, culverts, ditches, gutters, drop inlets and catch basins - Rain water Harvesting.
Unit IV	Solid waste or refuse Disposal <ul style="list-style-type: none"> - Refuse chutes. - Waste /kitchen - waste Managements
Unit V	Integration of Services <ul style="list-style-type: none"> - ETP, STP and other building management services like CCTV, PG & UPS

Learning Resources	
Text Books:	1. Benjamin Stein and John Renolds.(2006) <i>Mechanical and Electrical Equipment for Building</i> , New York, John Wiley and Sons.
Reference Books:	1. Vasisth K.(2011) <i>Waste management</i> New Delhi, Essential books. 2. National Building Code of India, 2005 (NBC 2005)
Websites:	http://bst1.cityu.edu.hk/e-learning
Journals:	CIBSE journal http://www.cibsejournal.com/ Building Services Engineering Research and Technology (bse.sagepub.com) Energy and buildings-Journal-Elsevier (www.journals.elsevier.com/energy-and-buildings/) Technical journals- CIBSE-(www.cibse.org/knowledge/technical-journals/technical-journals-bsert-lr-t)
Assessment	Marks

I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Detail services layout which includes water supply and sanitation requirements for a campus project. (Project is preferably the architectural design project which the students have already worked on)

Elective- V

Subject Code	K8408	Semester IV
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes: Student will be able to	
1	Engage in systematic self study of topics they feel interested in.

Students can select one elective from the following list	
1	<p>Housing</p> <ul style="list-style-type: none"> - Housing survey and methodologies - Factors effecting housings - Housing demand, slums, Typologies, finance, etc. - Comparative study of various housing policies and programmes. - Housing case studies - Post Occupancy evaluation. - Importance of housing in urban and regional development - Structural concepts, use of traditional and new building materials ,self help and low cost housing - Role of co-operative and public and private agencies
2	<p>Disaster Management</p> <ul style="list-style-type: none"> - Study of building designs to resist following types of disasters: Earthquake; Fire; Flood; Cyclone; Tsunami; Other natural disasters - Post-disaster problems - Study of geological structure and its deformation - Study of behaviour of the structure in such disasters - design aspects and considerations for various types of buildings especially the residential, congregational and institutional buildings
3	<p>Sustainable architecture</p> <ul style="list-style-type: none"> - Study of effects of Luminous Environment on comfort condition in built space, including Analysis Techniques, Design Strategies and Evaluation Procedures - Introduction and Analysis of the Precedent - Analysis of the site and climate - Analysis of the building programme and use. - Schematic design. - Design development. - System integration - Various rating systems like LEED, GRIHA.
4	<p>Industrial Architecture</p> <ul style="list-style-type: none"> - Location and planning aspects of Industrial areas - Indoor and Outdoor working environment in Industries - Services essential for Industries, considerations f industrial safety (Fire) - Various acts applicable to construction of industries such as Factory act,

	Pollution control Act etc. - Review of structural systems used for Industries with materials. - Environmental pollution as resultant of industrial activity.
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Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – VIII

Architectural Design VIII

Subject Code	K8409	Semester -VIII
Credits	10	Subject type-Core

Learning Objectives	
1	To develop understanding of present day urban/socio-economic/technological/infrastructural issues and identify redevelopment triggers.
2	To evaluate performance of a built space with respect to present day urban parameters.
3	To develop skill of feasibility analysis and design capacity in given urban context.

Learning Outcomes: Student will be able to	
1	Learn building Design issues such as parking, additional FSI with design and work out feasibility due to change in life style.
2	Redevelop a precinct to meet the present day needs like innovative technology
3	Study of relevant bylaws applicable for the above mentioned project.

Units	Contents
Unit I	Identify, Research and analyze urban issues such as parking/changed life style/changed urban fabric/infrastructure of a given plot of land and feasibility study.
Unit II	Case study of redevelopment projects
Unit III	Design of given plot (Redevelopment)

Learning Resources	
Text Books:	
Reference Books:	1. Shah Jagan, 2008, Contemporary Indian Architecture, Lustre Press 2008 8 ISBN 174364463, 9788174364463 2. National Building Code of India, 2016
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment Refer To 'Rule number 6, sub point 6.2.2.'	40
U.E.	University Examination Assignments or portfolios based on entire syllabus as mentioned below.	60

Assignment	
1	Collecting data about a project/site to be developed.
2	Feasibility study and formulation of design brief
3	Design: The project that can be taken up can be redevelopment of a plot, addition and alterations to existing structures/change of use.

Building Construction and Material VIII

Subject Code	K8410	Semester -VIII
Credits	04	Subject type-Core

Learning Objectives	
1	To introduce the concept of multi-basement and its construction systems.
2	To introduce the Acoustical design considerations for Auditorium and its construction systems.
3	To introduce various considerations in Design and Construction of high rise structures.

Learning Outcomes: Student will be able to	
1	Understand different systems of basement constructions and its services.
2	Understand different systems of Semi- permanent structures and its installation techniques.
3	Understand different design consideration for Auditorium and its systems of construction.

Units	Contents
Unit I	Swimming Pool <ul style="list-style-type: none"> • Components of Swimming pool like basin, drain, filter, deck, ladder, diving board, lane and lane marking etc. • Types like private, public, recreational, theme based, sports etc. • Materials used for swimming pool like brick, concrete, fiber reinforced etc. • Techniques used for constructions of swimming pool like underground, above ground, elevated etc. - Services related to swimming pool like filtration, electrical, drainage , maintenance etc.
Unit II	Stadium: <ul style="list-style-type: none"> • Introduction to Components of Stadiums like stadium field area, Seating area, envelope and roof. • Field area and their shapes, orientation, field drainage, field protection etc. • Stadium Bowl design parameters like viewing distances and sightlines, gangways, vomitories, media boxes, VIP areas, player areas, facility areas like food and services. • Building Envelope and roof materials and their technologies. • Roof design considerations like wind and sun. • Services related to Stadium like lighting, access control, signage, toilet, maintenance etc. -
Unit III	Semi-permanent Structures <ul style="list-style-type: none"> - Need, Planning and Layout, Installation techniques used worldwide. - Various Semi-permanent Structural systems for floor, wall, roof etc. - Services related to water and sanitation layout, natural and mechanical ventilation, lighting, insulation etc.
Unit IV	High Rise Structures <ul style="list-style-type: none"> - Design consideration like wind and seismic, foundation, form work systems,

	Construction Techniques and Building Envelope, mechanical floors. - Systems in steel and Concrete. - Structural glazing, elevators,
Unit V	Study of Materials - Study of different modern building materials with respect to Swimming Pool, Stadium, installable structures and high rise.

Learning Resources	
Text Books:	1. T.D Ahuja and G.S. Birdie (1996) <i>Fundamentals of Building Construction</i> New Delhi, Dhanpat Rai Publishing Company Pvt. Ltd
Reference Books:	2. J. S. Foster, Roger Greeno(2007) <i>Mitchell's Structure & Fabric: Part 2.</i> New York,Taylor and Francis group. 3. Gorenc, Tinyou, Syam(2005) <i>Steel Designer's Handbook</i> New Delhi,CBS Publishers and Distributor. 4. Ralph Monletta (1989) <i>Plastics in Architecture” – A guide to acrylic and Polycarbonate.</i> New York, Marcel Dekker Inc.
Websites:	https://www.som.com/ideas/research/design_of_high-rise_buildings www.losberger.com/us/en_us/applications/semi-permanent-structu... www.theatresolutions.net > Layouts & Design
Journals:	Journal of Construction Engineering, Technology stmjournals.com/index.php?journal=jocetm) Master Builder -Construction Magazine, Construction News(www.masterbuilder.co.in)

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Theory paper	

Assignments	
1	Portfolio of technical drawings of above mentioned topic with supporting documents of sketched booklet and pictographic presentation. (min.4drgs.)
2	Field reports and Market survey of building Material topics.
3	Proposals of different designs of swimming pool and sitting area for small scale stadia. (as per discretion of the subject faculty)

Vocabulary and Repertoire

Subject Code	K8411	Semester -VII
Credits	3	Subject type-Core

Learning Objectives	
1	To express understanding of architecture writings.
2	To learn vocabulary to be used for analyzing Architecture.

Learning Outcomes: student will be able to	
1	Acquire effective verbal communication in architecture
2	Write essays, research papers, book reviews etc.

Units	Contents
Unit I	Architectural expression <ul style="list-style-type: none"> - Form and expression - structural expression - society - culture and expression - spatial expression Vocabulary and grammar of form Glossary of technical words
Unit II	Architectural Journalism <ul style="list-style-type: none"> - Writing Descriptive and analytical reports - Book reviews - Page compositions
Unit III	Elements of Architecture <ul style="list-style-type: none"> - Basic elements of architecture - Modifying elements of architecture
Unit IV	Seminar on Architects Biography and Concepts in contemporary architecture

Learning Resources	
Text Books:	Simon Unwin (2009). <i>Analysing Architecture</i> third edition, revised and enlarged. USA and Canada by Routledge.
Reference Books:	John Ruskin (1989). <i>The seven lamps of Architecture</i> . London, Dover Publications Neelkanth Chhaya (2014). <i>Harnessing the intangible, collected essays on the work of Balkrishna Doshi</i> , New Delhi, NIASA Council of Architecture.

Assessment	Marks
I.A.	40
Internal Assessment Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	60
University Examination Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Writing Journals on Theory of design
2	Any one Book review and Any one Architects Biography

Interior Design II

Subject Code	K8412	Semester -VIII
Credits	04	Subject type-Core

Learning Objectives	
1	In this subject students will apply their skills, knowledge gained in the previous interior design studio for more complex interior design projects with all details of services.
2	The students will also understand the complex interior designing process, specification, various detailing and tentative estimate of to fulfill the needs of client.

Learning Outcomes: Student will be able to	
1	Acquire knowledge of various high end interior building materials their specification its cost and its application in interior design project.
2	Design complex Interior spaces with services, construction details with cost consideration to suit its function and aesthetics in a Systematic cad presentation with all detail drawings.

Units	Contents
Unit I	Introduction to the field of interior design with respect to services.
Unit II	Market survey of application of various finishing interior materials and techniques.
Unit III	Detailed Case study of a medium scale interior project. (150 sq.m to 250 sq.m.)
Unit IV	A detailed design of the medium scale interior projects showing all necessary services, specifications and costing. Carpet Area (150 sq.m to 250 sq.m.)

Learning Resources	
Text Books:	Office Spaces – Crane Dixon, Architectural Data Sheets
Reference Books:	Corporate Interiors – Kogek Yee, Office Interiors – Alan Phillips
Websites:	www.quadrille.co.in. www.theaid.in.
Journals:	Architectural Digest, Elle Décor, Home and Design, Interior Design etc.

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignment	
1	Report based on Market survey of interior Materials
2	Live Case Study of a completed Interior Project
3	Detailed drawings of the Interior Design project of the following – residential, public, commercial etc with thrust on services, specification and tentative

	estimate etc.
4	Design of the decorative ceiling, paneling, lightings, floor details, toilet details etc for the above projects.
5	Detailed design of two furniture units with specification and construction/ joinery details.

Urban Planning II

Subject Code	K8413	Semester -VIII
Credits	03	Subject type-Core

Learning Objectives	
1	To introduce students to the advanced concepts of Town and Urban Planning.
2	To understand the planning procedures at various levels of planning.
3	To understand the holistic relationship of planning with various other aspects of physical developments.
4	To develop an urban vocabulary required to understand urban form and public spaces

Learning Outcomes: Student will be able to	
1	Understand the interrelated concepts of Town and Urban Planning
2	Exposure to the various laws and rules for planning and balanced development.
3	Understand the effects of various policies on physical development.
4	Understand urban form and space

Units	Contents
Unit I	Introduction to the process of formulation and implementation of : Regional Plan, Development Plan and Town Planning Schemes. Study of various Planning agencies and their role in planning like HUDCO, CIDCO, HDFC, MHADA etc.
Unit II	Role and relevance of Transport Planning, Landscape and Environmental issues, Heritage etc in Urban Planning.
Unit III	Introduction to various planning tools. Methodology of conducting town planning surveys, types of surveys (physical, social, and economical, Aesthetic Surveys etc) and analysis of data collected.
Unit IV	Urbanization and Its Impacts. Introduction to Study of Contemporary Issues of Urban Development and concerns in the City.
Unit V	Policies and legal framework for contemporary planning development: National Missions, Schemes for funding various planning activities, infrastructure development schemes like JNNURM, HRIDAY, SMART CITY etc.
Unit VI	Introduction to urban design terminologies and definitions To understand the urban form derived from theories as well as empirical evidence.

Learning Resources	
Text Books:	6. Kevin Lynch (1960) <i>The Image of the City</i> USA, MIT press. 7. Lewis Mumford (1972) <i>The City in History: Its Origins, Its Transformations, and Its Prospects</i> .USA, Harcourt, Inc. 8. Peter Geoffrey Hall (1996 Updated Edition) <i>Cities of Tomorrow: An Intellectual History of Urban Planning and Design in the Twentieth Century</i> USA, Blackwell publishing. 9. Anthony J. Catanese, James C. Snyder (2014) <i>Urban Planning</i> . New Delhi, McGrawHill Education Private Limited.

	10. AbirBandyopadhyay, (2010) <i>Town Planning</i> , Kolkata, ArunabhaSen
Reference Books:	4. Brown A.J.(1969) <i>Introduction to town and country planning</i> Australia, Angus and Robertson publisher. 5. P.Healey,(1981) <i>Planning Theory</i> .UK, Pergamon Press 6. Arthur Gallion(1993) <i>The Urban Pattern</i> . New York, John Wiley and Sons
Websites:	www.planetizen.com/websites/2014 http://www.unhabitat.org/ / @UNHABITAT http://sustainablecitiescollective.com/ / @sustaincities
Journals:	Cities: The International Journal of Urban Policy and Planning Urban Policy and Research Urban Studies
Assessment	
I.A.	Internal Assessment
	Refer To 'Rule number 6, sub point 6.2.2.'
U.E.	University Examination
	Theory paper
	Marks
	40
	60

Research Skills

Subject Code	K8414	Semester -VIII
Credits	04	Subject type-Core

Learning Objectives	
1	To inculcate in students methodical process to approach an architectural design project holistically.
2	To develop research skills necessary to provide approach and directions in design of architectural project.
3	To develop a systematic approach of research for application in Architectural Design Project.
4	To develop skill sets of writing research paper

Learning Outcomes: student will be able to	
1	Develop primary skills to conduct research in Architecture
2	Demonstrate Visual Research Methods.
3	Demonstrate acquired research skills through the topic selected for Architectural Design Project.

Units	Contents
Unit I	Introduction to Research Skills , Types of research , Methods of data collection , Ethics ,and Referencing
Unit II	Visual Research Methods in Design Imageability Environmental mapping – Direct observation and direct communication Visual representation Environmental behaviour
Unit III	Selection of topic for Architectural Design project giving overview of introduction, background, context, relevance, scope and limitation, methodology and identification of case studies.
Unit IV	Demonstration of Case study and its analysis (Minimum two Book /live case studies) to understand the Project. Literature review minimum three research papers relevant to the research project
Unit V	Research Paper Writing

Learning Resources	
Text Books:	
Reference Books:	1. Robert Bechtel et al (eds). Methods in Environmental and Behavioral Research, NY:VanNostrand Reinhold, 1987. 2. Gary T Moore et al. Environmental Design Research Directions: Process and Prospect. New York: Preager Publishers, 1985. 3. Henry Sanoff. Visual Research Methods in Design. New York: Van Nostrand Reinhold, 1991
Websites:	
Journals:	

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Synopsis of Architectural design project.
2	Literature review.
3	Case studies and its analysis (minimum two).
4	Research Paper Writing.
5	Seminar presentation of components level research areas based on selected Architectural Design Project .

Elective- VI

Subject Code	K8415	Semester IV
Credits	2	Subject type-Elective

Learning Objectives	
1	To give students an opportunity to develop their skills in a subject they may opt for further studio.
2	To study the selected topic in depth of a particular subject that student is interested.
3	To prepare a technical base for students through in depth study.

Learning Outcomes: Student will be able to	
1	Engage in systematic self study of topics they feel interested in.

Students can select one elective from the following list	
1	<p>Real Estate Management</p> <ul style="list-style-type: none"> - Real estate development: Fundamental concepts and techniques, recognizing institutional and entrepreneurial elements, issues encountered in various phases of development like site evaluation and land procurement, development team assembly, -market study and development scheme, construction & project management, project marketing and hand-over of completed projects. -Development & project financing: Project Feasibility, Development Financing, Asset Disposal and Redevelopment Options, -Analyses of Development Sites and Case Studies, integrated case study on a specific development project, which requires reviewing, analyzing and resolving the problems or strategic issues. - Urban policy & real estate markets : Impact of Government Regulations and Public Policies on Real Estate Markets, include urban land rent and location theories, land use structures, community and neighbourhood dynamics, degeneration and renewal in urban dynamics, private-public participation, government policies on 95 public and private housing, and urban fiscal policy including property taxation, local government finance. - Corporate real estate asset management: Strategic plans to align real estate needs with corporate business plans; -Performance measurement techniques to identify asset acquisition or disposal; methods for enhancing value through alternative uses, efficient space utilization or improving user satisfaction. - Commercial real estate appraisals: Determination of the capitalization rates across different types of properties;-Appraisal of freehold and leasehold interests; -Critical analysis of the valuation approaches adopted for securitized real estate; Asset pricing models; investment flexibility and future redevelopment opportunities.
2	<p>Architectural Conservation</p> <ul style="list-style-type: none"> - History and theory of conservation - Philosophy of conservation

	<ul style="list-style-type: none"> - Pioneers of conservation - Definition of conservation, preservation, restoration, reconstruction ,Adoption - Broad concepts of terms such as Reuse, Rehabilitation, Revitalization, Regeneration, Up gradation etc. - Value and ethics - Traditional building materials and their decaying characteristics. Environmental influences: thermal effect, corrosion and oxidation. - Preparation of Inspection reports. - Cultural Heritage - Conservation methods - Classifications - Management of historic sites - Studies of various charters. <p>Role of INTACH, UNESCO, ECOMOS and other organizations</p>
3	<p>Digital architecture (can be a combination of seminar and workshop - project and practice based course)</p> <ul style="list-style-type: none"> -Compare approaches of design processes - conventional process focused on architects' style and contemporary process influences by digital tools -Introduce the new tools of design, production and fabrication in architecture that affect various stages of architectural production, from conception and visualization to development and manufacturing -Provide opportunities to integrate the use of the computer for design, production, and presentation with the help of individual projects -Provide understanding of software packages, and modeling techniques
4	<p>Architectural Software</p> <ul style="list-style-type: none"> -Provide hands-on exposure to various software packages to work on design, modelling, and simulations used in architectural design -Use of various (relevant at the time) 2D drafting and 3D modeling tools for rendering and architectural presentation -Use of various software packages for analysing building systems and services performance (this can be for passive and/or active measures relevant to the semester focus) -Options <p>Advanced AutoCAD Advanced SketchUp with various plugins Revit</p>

Assessment		Marks
I.A.	Internal Assessment	100
	Refer To 'Rule number 6, sub point 6.2.2.'	
Note	There is no 'University Examination' for this subjects	

Semester – IX

Practical Training

Subject Code	K8501	Semester -IX
Credits	30	Subject type-Core

Learning Objectives	
1	To acquaint students with prevalent purview and procedure of architectural and allied practice
2	To invite practitioners participation in the education of the 'would-be entrants' to the profession for up datedness of information and orientation
3	To boost the dialogue between 'practice' and 'academics' of architecture for progressive learning of a student

Learning Outcomes: student will be able to	
1	Develop skills in professional behavior
2	Explore different facets of office management including preparation of working drawings, detailed drawings, perspectives, study of filing systems of documentation, preparation of tender documents etc.
3	Gain site experience in respect of supervision of construction activity, observation, layout on site, taking the measurements and recordings.

Units	Contents
Unit I	<p>Indoor activities, office administration</p> <ul style="list-style-type: none"> - Routine correspondence with client's local authorities, contractors and other agencies dealing in building industries - Systematic filing and registering office correspondence for easy re-reference. - Regular maintenance of work-diaries with notes on principal's instructions, interviews with various agencies, indoor and/or outdoor work and time-spent - Systematic filing and indexing of technical catalogues and price lists for handy reference. - Systematic ordering and use of office library
UnitII	<p>Indoor activities, drawing and designing</p> <ul style="list-style-type: none"> - Making of preliminary designs and drawings accountably by requisite prior study, research, and case studies. - Preparing 'Presentation' 'statutory ', 'working' and 'detailed' drawings of customary contents and format by understanding their propriety and logic - Reading and making use of 'Contour Plans' while at VI & VII above - Dependably efficient handling of auxiliary routine operations like taking off and codified rendering of prints and electronic and/or computerized communication, drafting, copying etc - Briefing with various technical consultants and co-coordinating their drawings. - Preparation of 'study' and 'Presentation' models of buildings and/or development lay-outs in different levels and chromatic material-textures
Unit III	<p>Outdoor activities:</p> <ul style="list-style-type: none"> - Attending routine meetings with clients, local authorities, contractors and other trade representatives - Checking of lining-out of buildings on site - Systematic surveying of sites and/or existing buildings of moderate size and complexity in conventionally comprehensive format - Architecturally monitoring the work-progress on site/s through periodic

	supervisions, instructions and reports thereon
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Learning Resources	
Reference	Architects Drawings

Assessment		Marks
I.A.	Internal Assessment- Refer To ‘Rule number 6, sub point 6.2.2.’	40
1	The Log-Book duly filled in and authenticated by the said responsible registered architect- member of the employer-organization. (one member-signatory throughout Log-Book)	15
	Diary- The day to day hand-written preformed Work-Diary maintained by the student during the period of ‘training’ (as stipulated hereinabove) and certified by the said responsible registered architect-member of the employer-organization- one and the same members signatory who authenticates the Log-Book. (preferably initialed per day)	15
	Work report- The manually laboured ‘Work-Report’ structured as herein after prescribed under ‘Term work’ and authenticated too only by the said responsible registered architect-member of the employer organization. (One member-signatory who certifies Log-Book and Work-Diary).	10
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
	Portfolios consisting of drawings prepared by the student as intern in the office

Details of training	<p>-The practical training of minimum duration of 15 to 18 working weeks (90 work days) shall be carried out in the office of an architect or an organization Operating in an allied field of practice or research, duly approved by the institution, under mentorship of an architect having experience of at least 5 years.</p> <p>-Training in Foreign Country shall be done under the Registered Architect of that Country and to be approved and monitored by the Head of the Institution.</p>
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Semester – X

Architectural Design Project

Subject Code	K8502	Semester-X
Credits	16	Subject type-Core

Learning Objectives	
1	To inculcate in the students methodological process to approach an architectural project holistically.
2	To prepare students to handle large scale complex architectural projects individually.

Learning Outcomes: student will be able to	
1	Include intensive study of relevant literature, case studies, climatology and analysis of problems concerned with development of functional organisation of space form and structure.
2	Study based on correlation and interpretation of the social, economic and physical data.

Units	Contents
Unit I	The architectural project should consist of 2 parts: A. Technical Report: well documented report consisting of hypothesis formulation, data acquisition, verification, and analysis by following qualitative and quantitative research methods. B. Design Solution: Self explanatory drawings, covering various aspects of construction, function, technology, services, and site planning etc. few suggested buildings types are institutional projects, civic amenities, commercial, industrial, sports and recreation, administrative, transportation facilities, housing, specialized building, etc.
Unit II	Technical report: - A hard bound copy of original report shall be submitted, which will be certified and signed by the college authorities as authentication of the work and by the guide who has guided the work - Size: Project Report size A4 Sized '120 Mm x 297 mm portrait with embossed title necessarily on the spine and front page. - Total Pages: There Shall Be Maximum 50 Pages with double side printing excluding drawings. - Printing: Font type like Arial/ Times New Roman With 12-point size shall be used for regular typing with 15- point size shall be used for captions. The typing shall be done with 1.5 lines spacing throughout. - The presentation copy shall be necessarily a hard bound copy. Number of copies shall be as prescribed by the college. (1 copy for the student, 1 original copy for the college library and 1 soft copy on a CD.)
Unit III	Design solution: Graphically presented design solution with minimum 5000 Sq.M Built up area shall be in form of a drawing portfolio. It shall consist sufficient number of architectural drawings (manually drawn / computerized) with models, etc. Since the architectural project is the culmination of five years of learning in various aspects of architecture, it is expected that student demonstrates an ability of holistic and comprehensive thinking in the areas of, - Site Planning - Structural considerations

	<ul style="list-style-type: none"> - Space Designing - Landscape Design - Building Services - Climate Responsive, Energy Efficient and Exhibiting Qualities of sustainable architecture. - Architectural Detailing. <p>The portfolio will consist of drawings (minimum of 10 and maximum of 15) sufficiently in detail to demonstrate consideration given to above mentioned attributes. The emphasis shall be given to prepare self-explanatory drawings.</p>
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Learning Resources: As required by individual project.

Assessment		Marks
I.A.	Internal Assessment	40
	The Internal Assessment of “Architectural Project shall be carried out stage wise as decided by the subject Coordinator for the year which shall be announced to the students at the beginning of the semester.	
U.E.	University Examination	60
	The final assessment in the examination shall be done by both internal and external examiners in which the student will display his/her work and answer all the queries raised by the examiner.	

Capstone Project

Subject Code	K8503	Semester -X
Credits	06	Subject type-Core

Learning Objectives	
1	To study interrelationship of all subjects that a student has learned in the curriculum of architectural studies.
2	To understand the architecture as a “craft”.

Learning Outcomes; Student will be able to	
1	Develop competence in transforming architectural drawing to professional working document
2	Prepare documents of building design project minimum 500 Sq.M. such as Presentation drawings, Working drawings, Specifications, Quantities, Estimates, and Tender document.

Units	Contents
Unit I	Preparation of working drawing, municipal drawing of the above
Unit II	Preparation of Specifications and Bill of Quantities (BOQ)
Unit III	Preparation of Contract Document

Learning Resources	
Text Books:	
Reference Books:	<ol style="list-style-type: none"> 1. Wakita, Osamu A., Richard M. Linde, and Nagy R. Bakhom (2011) "The Professional Practice of Architectural Working Drawings. 2. Reference drawings from an ISO certified architect’s office 3. Handbook of Professional Documents: 2011, Council of Architecture, New Delhi, India 4. Indian Institute of Architects, Handbook
Websites:	
Journals:	Gawne, Eleanor. "Cataloguing Architectural Drawings." Journal of the Society of Archivists 24.2 (2003): 175-187.

Assessment		Marks
I.A.	Internal Assessment	40
	Refer To ‘Rule number 6, sub point 6.2.2.’	
U.E.	University Examination	60
	Assignments or portfolios based on entire syllabus as mentioned below.	

Assignments	
1	Assignment I: Preparation of Presentation Drawings with rough estimates
2	Assignment II: Preparation of Set of Working Drawings, Specifications, BOQ, and Contract Document

Professional Practice

Subject Code	K8504	Semester -X
Credits	4	Subject type-Core

Learning Objectives	
1	To introduce aspects of professional conduct, duties and responsibilities, legal rights and procedures of architectural profession.
2	To enable student to acquaint with various responsibilities of professional architect.
3	To acquaint students with documentation and procedures for execution of building work/projects as well as with management aspects

Learning Outcomes	
1	Visualise various working situations that may arise in practice as an architect
2	Manage his/her professional environment towards fair practice
3	Understand ethics of architectural profession
4	Learn to work with various agencies in practice

Units	Contents
Unit I	Laws, Rules and Guidelines related to Architectural Practice <ul style="list-style-type: none"> - Architects Act 1972 - brief overview, introduction to nature, scope and functions of Council of Architecture - Detailed study of professional conduct regulation - Comprehensive architectural services, scale of professional fees as framed by Council of Architecture - Architectural competitions guidelines by Council of Architecture - Architects Liability
Unit II	Setting up architectural practice as profession, tax liabilities <ul style="list-style-type: none"> - Nature of profession, difference between trade, business and profession - Emerging Role of architectural profession - Accounting and taxation - Organization of architects office and different models of business
Unit III	Land tenures and contracts <ul style="list-style-type: none"> - Introduction to valuation, land tenures and easements and dilapidations - Architects role in construction contracts

Learning Resources	
Text Books:	RoshanNamavati (1968). Professional Practice: Estimating and Valuation, , Universal Book Corporation
Reference Books:	MadhavDeobhakta, MeeraDeobhakta (2007) Architectural Practice in India, , Council of Architecture, New Delhi Handbook of Professional Documents: 2011, Council of Architecture, New Delhi, India Indian Institute of Architects, Handbook Standard Contracts, International Federation of Consulting Engineers (FIDIC) The Architect's Handbook of Professional Practice- 2013, American Institute of Architects, John Wiley & Sons.
Websites:	

Journals:	
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Assessment		Marks
I.A.	Internal Assessment	40
	Refer To 'Rule number 6, sub point 6.2.2.'	
U.E.	University Examination	60
	Theory paper	

Self Study

Subject Code	K8505	Semester -X
Credits	4	Subject type-Core

Learning Objectives	
1	To facilitate the students to learn out of a pool of specialized subjects, which provides extended scope or which enables exposure to cross-disciplinary subjects
2	To facilitate the students to learn cross-disciplinary subjects.

Learning Outcomes	
1	Engage in systematic self study.

Units	Contents
	Under this, the student can select any one subject related the parent course or other than the parent course. The choice of the subject is not restricted. If a student is interested in a subject of a particular discipline he/she has to inform accordingly to the Principal and academic Co-ordinator of that department.

Learning Resources: As required by subject.

Assessment		Marks
U.E.	University Examination	100
	Based on Reports and evidences of the course	