

**Regulations and Curriculum for  
Bachelor of Architecture (B.Arch.)**

**Choice Based Credit System (CBCS)  
for Batch admitted from 2020-21**



(Deemed to be University under Section 3 of UGC Act, 1956)

(Placed under Category 'A' by MHRD, Govt. of India, Accredited with 'A+' Grade by NAAC)

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## **VISION**

*To build a humane society through excellence in education and healthcare*

## **MISSION**

*To develop*

*Nitte (Deemed to be University)*

*As a center of excellence imparting quality education,  
generating competent, skilled manpower to face the scientific and social  
challenges with a high degree of credibility, integrity,  
ethical standards & social concern*



## Content

	<b>Page No.</b>
Notification	iv-viii
Regulations and Curriculum	1-25
Preamble	1
1. Introduction	1-2
2. Definitions	2-3
3. Duration of the program	3
4. Medium of Instruction and Examinations	3
5. Maximum period for completion of the Program	3
6. Eligibility for Admission	3-4
7. Full time Mode	4
8. Selection of Eligible Candidates	4
9. Withdrawal – Temporary and Permanent	4-5
10. Migration Policy	5
11. Conduct and Discipline	5
12. Graduation Requirements	5
13. Convocation	5-6
14. Structure of the program	6-7
15. Courses of Study	8-21
16. Attendance	21-22
17. Examination and Assessment	22
18. Academic Performance Evaluation	23-25
19. Supplementary Examinations	25
20. Award of Merit Certificates	25
Syllabus, Program Outcomes	26 - 27

<b>SEMESTER 1</b>	28-37
Foundation Studio	29-30
Culturescapes	31-32
Environment and Building Physics	33-35
Architectural and Visual Representation	36-37
<b>SEMESTER 2</b>	38-47
Introduction to Architectural Design	39-40
Architecture and Change	41-42
Climate, Site and Superstructure	43-45
Graphics and Communication	46-47
<b>SEMESTER 3</b>	48-55
S3 Vertical Studio	49-50
History and Construction	51-52
Environment and Building Structures	53-55
<b>SEMESTER 4</b>	56-63
Housing Studio	57-58
History and Urbanism 1	59-60
Building Systems and Electrical Services	61-63
<b>SEMESTER 5</b>	64-71
S5 Vertical Studio	65-66
History and Urbanism 2	67-68
Building Detailing and Valuation	69-71
Co-operative Learning Preparation	72
<b>SEMESTER 6</b>	73-74
Co-operative Learning	74
<b>SEMESTER 7</b>	75-81
Urban Studio / Exchange Studio	76-78
Building Systems and Practices	79-81
<b>SEMESTER 8</b>	82-98
Vertical Studio 2: Advanced Design	83-85
Vertical Studio 2: Conservation	86-87
Vertical Studio 2: Landscape	88-89
Vertical Studio 2: Sustainability	90-91
Vertical Studio 2: Urban Housing	92-93
Management and Interior Systems	94-96
Dissertation	97-98
<b>SEMESTER 9</b>	99-100
Internship	100

<b>SEMESTER 10</b>	101-117
Architectural Thesis	102-103
Capstone Project: Advanced Design	104-106
Capstone Project: Conservation	107-108
Capstone Project: Landscape	109-110
Capstone Project: Sustainability	111-112
Capstone Project: Urban Housing	113-115
Professional Practice	116-117

# Nitte University

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Ref:NU/REG/S3/2014-15/754-E

Date:24-03-2015

## NOTIFICATION

### **Subject: Regulations, Scheme and Syllabus for B.Arch. Program**

In exercise of the powers conferred under Rule No. R.9 of the MoA, the Academic Council in its 24th meeting held on 17-03-2015 under the agenda item No. AC/12- 24/15 has been pleased to approve the regulations, scheme and syllabus pertaining to B.Arch. (Bachelor of Architecture) course in Nitte Institute of Architecture.

The Regulations, scheme and syllabus shall come into force from the academic year 2015-16.

By order,

**REGISTRAR**

# Nitte University

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NU/REG/AC-NIA/2016-17/690

31.03.2017

## NOTIFICATION

### **Sub: Modified Syllabus for B.Arch. Program**

In exercise of the powers conferred under Rule No. R.9 of the MoA, the Academic Council in its 31<sup>st</sup> meeting held on 14-03-2017 under the agenda item No. AC/6(2)- 31/17 has been pleased to approve the modified syllabus for B.Arch. (Bachelor of Architecture) Program.

By order,

**REGISTRAR**

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**Ref: NU/REG/AC-NIA/2018-19/373**

**Date: 01.12.2018**

**NOTIFICATION**

**Sub: Changes in Regulations and Curriculum of B.Arch. Program.**

In exercise of the powers conferred under Rule No. R.9 of the MOA, the Academic Council in its 37<sup>th</sup> meeting held on 20-11-2018 under the agenda item no. AC/8(2)- 37/18 is pleased to approve the following changes in Regulation and curriculum in B.Arch. programme for the batch admitted in 2018-19 and onwards.

**1. SEE Scheme Reform**

- a. Total Marks allotted to CIE and SEE will continue to be in the ratio of 50:50. SEE evaluation marks allotted will be allotted a similar ratio between the jurors and evaluators.

**2. CIE Reform**

- a. A candidate must secure at least 50% of total marks fixed for internal assessment in particular course in order to be eligible to appear for the Semester End Examination of that course.

**3. Carry Over Reforms for batch 2018-19 onwards.**

By Order,

**REGISTRAR**

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**Ref:N(DU)/REG/AC-NIA/2019-20/491**

**Date: 05-03-2020**

**NOTIFICATION**

**Sub: Partial amendment in Regulations of B.Arch. Programme 2018-19.**

In exercise of the powers conferred under Rule No. R.9 of the MoA, the Academic Council in its 42<sup>nd</sup> meeting held on 29-02-2020 under the agenda item no. AC/5- 42/20 is pleased to approve the revised Regulations of B.Arch. programme for the batch admitted in 2018-19 and onwards.

By Order,

**REGISTRAR**

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**Prof. Dr. Alka Kulkarni**  
**Registrar**

**Ref:N(DU)/REG/AC-NIA/2020-21/966**

**Date: 05-07-2021**

**NOTIFICATION**

**Sub: Approval of B. Arch revised Regulations & Course Curriculum**

In exercise of the powers conferred under Rule No. R.2.1 (C) of the MoA (2019), the Academic Council in its 46<sup>th</sup> meeting held on 26-06-2021 under the agenda item no. AC/7-46/21 resolved to approve the B. Arch revised Regulations & Course Curriculum.

By Order,

**REGISTRAR**



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Accredited as 'A+' Grade University by NAAC  
Mangaluru, Karnataka, India

## **Regulations and Curriculum For Bachelor of Architecture (B.Arch.) Choice Based Credit System**

### **Preamble:**

The Bachelor of Architecture (B.Arch.) Program was started in the year 2015 by Nitte (Deemed to be University) with the vision of building a learning campus that supports creative exploration and nurtures the journey of students towards a sustainable architectural practice.

The five-year B.Arch. program is approved by the Council of Architecture (COA) as well as All India Council for Technical Education (AICTE). Nitte Institute of Architecture has been envisioned as a centre for excellence in tropical architecture with partners across the globe, and plans to offer Post Graduate, and Doctoral programs.

The progressive curriculum was developed by academic and professional entities from around the world and has been designed to integrate hands-on practical training with theory-based education. Design excellence is encouraged through rigorous theoretical training, experiential learning, critical thinking, innovative pedagogy, craft and skill-building, dialogue and collaboration.

The program hopes to lead a new generation of holistic professionals that work with a deeper understanding of architecture by bringing together meaningful insights of experiential learning from both academia and professional practice.

Five years into the program, the curriculum and syllabus have been reviewed and revised as per the regulations of the Council of Architecture. Efforts have been made to make the curriculum and syllabus compliant with international validation standards such as UNESCO – UIA Charter for Architectural Education and Royal Institute of British Architects (RIBA).

The regulations for this course are formulated as under.

### **1. Introduction:**

- 1.1. These regulations shall be called Nitte (Deemed to be University) Regulations for Bachelor of Architecture (B.Arch.) program and govern the policies and procedures including selection, admission, imparting of instructions, conduct of examinations, evaluation and certification of candidate's performance and all amendments there to, leading to the award of Bachelor of Architecture (B.Arch.) degree. The regulations shall come into effect from the academic year 2020-21 and is applicable to the batch admitted from 2020-21 and onwards.
- 1.2. This set of regulations is in conformance to the stipulation, norms and regulations laid down by the Competent Regulatory Authorities and shall be binding on all the candidates undergoing the said degree program.

- 1.3. These regulations may be modified from time to time as mandated by the statutes of the University and the Competent Regulatory Authorities.
- 1.4. This set of regulations may evolve and get refined or updated or amended or modified or changed through appropriate approvals from the Academic Council or the Board of Management from time to time and shall be binding on all parties concerned including the Candidates, Faculty Members, Staff, Departments, and Institute Authorities.
- 1.5. All disputes arising from this set of regulations shall be addressed to the Board of Management. The decision of the Board of Management is final and binding on all parties concerned. Further, any legal disputes arising out of this set of regulations shall be limited to jurisdiction of Courts of Mangalore only.

## 2. Definitions:

Unless the context otherwise requires,

- *Academic year* means a 12-month period starting with the commencement of an odd semester.
- *Aptitude Test* means Aptitude Test in Architecture prescribed by the Competent Regulatory Authorities.
- *Audit Course* means course/s aimed at supplementing a candidate's knowledge and/ or skills. These will be reflected in the grade card but shall not be taken into account in determining the candidate's performance in the semester. However, it is mandatory that a candidate pass the audit course to be eligible for the award of the degree.
- *B.Arch.* means Bachelor of Architecture.
- *BoM* means Board of Management of Nitte (Deemed to be University).
- *BoS* means Board of Studies in Architecture.
- *COA* means Council of Architecture.
- *College/ Institute* means Nitte Institute of Architecture.
- *Competent Regulatory Authorities* mean the Council of Architecture (or) the competent authority of the Central Government or the respective State Government. The decision of the University/Institute shall be final in determining the competent authority regarding any specific regulatory matter.
- *Course* may comprise of studio, lectures, workshop, laboratory work, field work, research, self-directed study, online learning, special study, and internship or a combination of some of these.
- *CIE* means Continuous Internal Evaluation.
- *Credit* means a unit by which the course work is measured. It determines the number of hours of instruction required per week. One lecture period or hour shall have one credit; one lab/ workshop or studio exercises or seminar periods or hours shall have one credit; and one design studio or construction studio or project or thesis period or hour shall have one credit.
- *Credit Based Semester System (CBSS)*: means a system wherein the requirement for awarding a degree (or diploma or certificate) prescribed in terms of number of credits to be completed by the candidates.
- *Credit Point* is the product of grade point and number of credits for a course.
- *Cumulative Grade Point Average (CGPA)*: means a measure of the overall cumulative performance of a candidate across all semesters. The CGPA is the ratio of total credit points secured by a candidate in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.
- *Department* means Department or a Centre within the Institute.
- *Grade Point* means a numerical weight allotted to each letter grade on a 10-point scale.

- *Head of the Institute* means the Dean/ Principal/ Director of the College (Nitte Institute of Architecture)
- *Head of the Department (or) Head of the Centre* means a full-time faculty appointed/ nominated by the Head of the Institute/ University for managing the Department and authorized to and responsible for the implementation of the rules and procedures pertaining to the Department.
- *Letter Grade*: It is an index of the performance of a candidate in a said course. Grades are denoted by letters O, S, A+, A, B+, B, C, F and I.
- *Program* means an educational program leading to award of a Degree (B.Arch.).
- *Regulations* means this set of academic regulations
- *SEE* means Semester End Examinations.
- *External Evaluation (EE)* is a form of Semester End Examination (SEE) to evaluate course work presented through portfolio, viva-voce, jury.
- *Semester Grade Point Average (SGPA)* means a measure of performance of work done in a semester. It is ratio of total credit points secured by a candidate in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.
- *University* means Nitte (Deemed to be University).

**3. Duration of the program:**

- 3.1 The duration of the B. Arch program shall be 5 academic years including internship.
- 3.2 The program is framed as a two-stage process – Stage 1 consisting of Level 1 (semester 1 & 2) and Level 2 (semester 3 to 6) and Stage 2 consisting of Level 3 (semesters 7 to 10).

**4. Medium of instruction and examinations:**

The medium of instruction and examination shall be English.

**5. Maximum period for completion of the program:**

The Architecture Program shall be completed in a maximum period of 8 consecutive years. However, in special circumstances a candidate may be granted an extension of 1 year by the University/ Institute to complete the program. This extension shall be given only once to the candidate.

**6. Eligibility for admission:**

- 6.1. No candidate shall be admitted to the Bachelor of Architecture (B.Arch.) Program until they have attained 17 years of age on or before 31st December of the admission year

and

has passed 2 years PUC examination of PUE Board, Karnataka or an equivalent examination of any other approved Board or University at the end of the 10+2 scheme of evaluation with not less than 50% marks in Physics, Chemistry and Mathematics and also 50% marks in aggregate in the 10+2 examination courses OR 10+3 Diploma Examination recognized by Central/ State Governments with Mathematics as a compulsory subject and not less than 50% marks in aggregate. OR International Baccalaureate, after 10 years of schooling, with not less than 50% marks in aggregate and with Mathematics as a compulsory subject of examination

and

In addition to the above, the candidate needs to qualify in the aptitude test prescribed by the Competent Regulatory Authorities.

- 6.2. For SC/ST candidates the minimum percentage of marks shall be a pass with 45% of the aggregate marks in the qualifying examination and qualifying in the aforementioned aptitude test.
- 6.3. Foreign Nationals and candidates who have qualified from a Foreign University/Board should obtain permission from Nitte (Deemed to be University) prior to the admission for equivalence of the qualification and other regulatory requirements.

**7. Full time Mode:**

A candidate shall study in the Institute for the entire period as a full-time student. No candidate may register for any other degree examination conducted by this University or any other University in India or abroad during the period of study.

**8. Selection of Eligible Candidates:**

Selection to the B.Arch. program shall be based on the basis of combined merit obtained in the qualifying examination (as stated in clause 6.1) and the aptitude test in the ratio of 50:50.

**9. Withdrawal – Temporary and Permanent:**

**9.1. Temporary:**

9.1.1.A candidate who has been admitted to the program may be permitted to withdraw temporarily for a period of six months or more up to one year, preferably in one academic year under the following conditions:

To initiate start-up ventures, product development, foreign transfer etc. This however, is permitted only on the successful completion of all courses in the first six semesters. A request, with ample evidence to the seriousness of the venture, should be forwarded to the Head of Institute for approval,

OR

On the grounds of prolonged illness, grave calamity in the family, etc. provided:

- a. They apply stating the reason of withdrawal with supporting documents and endorsement by parent/ guardian.
- b. The Institute is satisfied that the candidate is likely to complete their requirement of the degree within maximum time specified.
- c. There are no outstanding dues or demands with the department, Institute, library, hostel, etc.

9.1.2. The tuition fee for the subsequent year maybe collected in advance at the discretion of the University/Institute before giving approval for any such temporary withdrawal.

9.1.3. Scholarship holders are bound by the appropriate rules applicable

9.1.4. The decision of the Institute/University regarding withdrawal of a candidate is final and binding.

**9.2. Permanent:**

9.2.1. A newly admitted candidate who withdraws admission before closing date of admission for the academic session is eligible for the refund of the deposit only. The fees once paid will not be refunded on any account.

9.2.2. If a candidate wants to leave the Institute, they will be permitted to do so and take the Transfer Certificate from the Institute/ University, if required, only after remitting the tuition fees for the remaining years.

9.2.3. Those candidates who have received any scholarship/ stipend/ other forms of assistance

from the Institute shall repay all such amounts in addition to those mentioned in the clause above.

The decision of the Institute/University regarding withdrawal of a candidate is final and binding.

#### 10. **Migration Policy**

Migration of a student of any semester from another institute is permitted at the discretion of the institutes involved, subject to the number of students not exceeding the permitted maximum intake in that class in the Institute and the same shall be notified by the Institute to the Competent Regulatory Authority.

#### 11. **Conduct and Discipline:**

**11.1.** A Code of Conduct and Policy Against Sexual Harassment, Policy Against Substance Abuse, Policy on Intellectual Property Rights Protection, Information Technology Policy and other policies have been formulated to provide a clear statement of the University's expectations of students in respect of academic matters and personal behavior. Study at the Institute presents opportunities for interacting with other members of the University community. The University recognizes and values the diversity of student experiences and expectations, and is committed to treating students, both academically and personally, in a fair and transparent manner. All students, in return, are required to comply with the requirements set down in the Code of Conduct published by the University and made available on the University website.

#### **11.2. Ragging**

11.2.1. As per the Order of the Honourable Supreme Court of India, ragging in any manner is considered a punishable criminal offence and is banned. Any student found indulging in ragging, in whatever manner, either directly or indirectly, shall be severely dealt with.

11.2.2. According to Karnataka Education Act, 1983 (Karnataka Act No. 1 of 1995) Section 2 (29) "Ragging means causing, inducing, compelling or forcing students, whether by the way of a practical joke or otherwise, to do any act which detracts from human dignity or violated their person or exposes them to ridicule or to forbear from doing any lawful act by intimidating wrongfully restraining, wrongfully confining or injuring them or by using criminal intimidation, wrongful restraint, wrongful confinement, injury or the use of criminal force".

#### 12. **Graduation Requirements:**

Candidate shall be declared eligible for the award of the degree if they have:

- Fulfilled the degree requirements.
- No dues to the University, Institute, Departments, Hostels, Library, etc.
- No disciplinary action pending against them.

The award of the degree must be recommended by the Board of Management.

#### 13. **Convocation:**

Degrees will be awarded to all the eligible candidates who have graduated during the preceding academic year at the annual convocation. For eligible candidates who are unable to attend the convocation, degree will be sent by post. Candidates are required to apply for the convocation along-with prescribed fee within the specified date, after satisfactory completion of all degree requirements.

**14. Structure of the program:**

The program is structured on Credit Based System and Continuous Evaluation following the semester pattern. A candidate shall have earned 240 credits and 80 hours of Value-Added Courses to be eligible for the award of B.Arch. Degree of the University.

Type of Courses	Credits
Professional Core Courses	120
Building Sciences and Applied Engineering Courses	48
Professional Elective Courses	36
Professional Ability Enhancement Courses	36
Value Added Courses	-
<b>Total Credits</b>	<b>240</b>

For a semester-wise distribution of credits please refer to Annexure 1.

**The Program consists of the following Mandatory Courses:**

Sl. No.	Professional Core Courses	Building Sciences and Applied Engineering Courses	Professional Ability Enhancement Courses
1.	Foundation Studio	Environment and Building Physics	Cooperative Learning
2.	Culturescapes	Climate, Site and Superstructure	Dissertation
3.	Architectural and Visual Representation	Environment and Building Structures	Internship
4.	Introduction to Architectural Design	Building Systems & Electrical Services	Professional Practice
5.	Architecture and Change	Building Detailing & Valuation	
6.	Graphics and Communication	Building Systems and Practices	
7.	S3 Vertical Studio	Management and Interior Systems	
8.	History and Construction		
9.	Housing Studio		
10.	History and Urbanism 1		
11.	S5 Vertical Studio		
12.	History and Urbanism 2		
13.	Urban Studio / Exchange Studio		
14.	Vertical Studio 2		
15.	Architectural Thesis		
16.	Capstone Project		

**The Program consists of the following types of Elective Courses:**

Elective Course Type
----------------------

L2	Level 2 Elective Courses
L3	Level 3 Elective Courses
EO	Elective Courses (Open)
EG	Elective Courses (Global)

The following is a list of elective course categories. Elective courses will be offered under one of the following categories. Electives shall be offered at the discretion of the Institute.

<b>Sl. No.</b>	<b>Elective Course Categories</b>
1	Site Analysis / Documentation
2	Global History
3	Study Tour
4	Interior Design
5	Product Design
6	Material Workshop
7	Construction Workshop
8	Conservation and Heritage
9	Design Process and Theory
10	Health Sciences
11	Media Studies
12	Performing Arts
13	Visual Arts
14	Computation and Graphics
15	Environmental Studies
16	Innovative Technologies
17	Building Performance
18	Sustainability
19	Humanities
20	Professional Training
21	Research
22	Intellectual Property Rights
23	Entrepreneurship
24	Innovation and Design Thinking

**15. Courses of Study:**
**SEMESTER 1 (LEVEL 1)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR11	Foundation Studio	12	12	1200	600	600	300	300	-	-
2	20BAR12	Culturescapes	3	3	300	150	150	75	75	-	-
3	20BAR13	Environment and Building Physics	6	6	600	300	300	150	150	-	-
4	20BAR14	Architectural and Visual Representation	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

**SEMESTER 2 (LEVEL 1)**

Courses of Study and Training					Scheme of Examination						
S. No	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext	Marks	Duration of Exam
1	20BAR21	Introduction to Architectural Design	12	12	1200	600	600	300	300	-	-
2	20BAR22	Architecture and Change	3	3	300	150	150	75	75	-	-
3	20BAR23	Climate, Site and Superstructure	6	6	600	300	300	150	150	-	-
4	20BAR24	Graphics and Communication	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

**SEMESTER 3 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR31	S3 Vertical Studio	12	12	1200	600	600	300	300	-	-
2	20BAR32	History and Construction	3	3	300	150	150	75	75	-	-
3	20BAR33	Environment and Building Structures	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

**SEMESTER 4 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR41	Housing Studio	12	12	1200	600	600	300	300	-	-
2	20BAR42	History and Urbanism 1	3	3	300	150	150	75	75	-	-
3	20BAR43	Building Systems & Electrical Services	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

**SEMESTER 5 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR51	S5 Vertical Studio	12	12	1200	600	600	300	300	-	-
2	20BAR52	History and Urbanism 2	3	3	300	150	150	75	75	-	-
3	20BAR53	Building Detailing & Valuation	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

**SEMESTER 6 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR65	Cooperative Learning	—*	24	2400	1200	1200	600	600	-	-
<b>Total</b>			—	<b>24</b>							

\* As per Regulations

**SEMESTER 7 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR71	Urban Studio/ Exchange Studio	12	12	1200	600	600	300	300	-	-
2	20BAR73	Building Systems and Practices	6	6	600	300	300	100	100	100	3 Hours
3	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*Two elective courses of 3 credits each are recommended

**SEMESTER 8 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR81 X	Vertical Studio 2	12	12	1200	600	600	300	300	-	-
2	20BAR83	Management and Interior Systems	6	6	600	300	300	100	100	100	3 Hours
3	20BAR85	Dissertation	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

X Course Number e.g., 1,2,3 etc.

**Vertical Studio Options\***

- 1 Vertical Studio 2: Advanced Design
- 2 Vertical Studio 2: Conservation
- 3 Vertical Studio 2: Landscape
- 4 Vertical Studio 2: Sustainability
- 5 Vertical Studio 2: Urban Housing

\*The Vertical Studio options listed above will be offered at the discretion of the Institute. Conditions Apply.

**SEMESTER 9 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR95	Internship	—*	24	2400	1200	1200	600	600	-	-
<b>Total</b>			—	<b>24</b>							

\* As per Regulations

**SEMESTER 10 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR 101X	Architectural Thesis/ Capstone Project	15	15	1500	750	750	375	375	-	-
2	20BAR 105	Professional Practice	3	3	300	150	150	50	50	50	2 Hours
3	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*Two elective courses of 3 credits each are recommended.

*X Course Number e.g., 1,2,3 etc.*

**Architectural Thesis/**

**Capstone Project Options\***

0 Architectural Thesis

1 Capstone Project: Advanced Design

2 Capstone Project: Conservation

3 Capstone Project: Landscape

4 Capstone Project: Sustainability

5 Capstone Project: Urban Housing

\*The Capstone Project options listed above will be offered at the discretion of the Institute. Conditions Apply.

**ELECTIVE (Level 2, Level 3, Open Elective, Global Elective)**

Courses of Study and Training					Scheme of Examination				
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation	
					Total Marks (CIE + SEE)	CIE	SEE	Portfolio/ Viva*	
								Int.	Ext.
1	20BAR YY EX	Elective*	3	3	300	150	150	75	75
<b>Total</b>			<b>3</b>	<b>3</b>					

20 2020 Year of Syllabus Revision    E Elective  
 BAR B.Arch.                                    X Course Number e.g., 1,2,3 etc.  
 YY Year of offering

**Course Format Categories**

20BAR YY E1	Site Analysis / Documentation	20BAR YY E13	Visual Arts
20BAR YY E2	Global History	20BAR YY E14	Computation and Graphics
20BAR YY E3	Study Tour	20BAR YY E15	Environmental Studies
20BAR YY E4	Interior Design	20BAR YY E16	Innovative Technologies
20BAR YY E5	Product Design	20BAR YY E17	Building Performance
20BAR YY E6	Material Workshop	20BAR YY E18	Sustainability
20BAR YY E7	Construction Workshop	20BAR YY E19	Humanities
20BAR YY E8	Conservation and Heritage	20BAR YY E20	Professional Training
20BAR YY E9	Design Process and Theory	20BAR YY E21	Research Intellectual
20BAR YY E10	Health Sciences	20BAR YY E22	Property Rights
20BAR YY E11	Media Studies	20BAR YY E23	Entrepreneurship
20BAR YY E12	Performing Arts	20BAR YY E24	Innovation and Design Thinking

### **15.1.Design Studio courses, Co-operative Education, Internship/ Practical training, and Value-Added Courses:**

As a partial fulfilment of the requirements of the B.Arch. program a candidate is required to complete Design Studio courses, Co-operative Learning, Internship or Practical training, and Value-Added Courses.

#### **15.1.1.Design Studio Courses**

Design Studios form the crux of the architectural educational curriculum. Studios are where students synthesize their learnings in various other courses and apply it towards the design of an architectural project.

##### **15.1.1.1. Foundation Studio**

Level 1 students, in semester one and semester 2, go through a process of learning design fundamentals that forms the basis of their architectural education. Hands-on work during the first year sensitizes students and helps them retain their knowledge of fundamentals better. This studio is supervised by design faculty with expertise in the fields of architecture, mechanical engineering, ecology, product design, theatre, music, and dance. Students begin by identifying essential elements from nature, developing and abstracting them through a series of iteration. They are then taught to use the workshop to develop models that are dynamic and reflect the abstraction that evolves from natural forms and their movement. There is potential for these creations to be built further into products.

##### **15.1.1.2. Vertical Studio**

Vertical Studios are conducted at Level 2 between semester three and semester five focusing on institutional projects, and at Level 3 between semester eight and semester ten as an advanced studio focusing on Advanced Design, Conservation, Landscape, Sustainability, and Urban Housing.

##### **15.1.1.3. Travel Studio**

The Urban Studio, conducted at Level 3, in the seventh semester, is a Travel Studio, designed to travel based on resources available at the time. Students travel to the city of study and stay for an extended period, learning and working on-site. Apart from providing students with an excellent opportunity to interact with experts in the field, the travelling studio allows them to observe, understand and address real-life issues on-site, stimulating their critical thinking and problem-solving abilities.

#### **15.1.2. Co-operative Learning:**

Co-operative Learning is an experiential learning program that takes education beyond the classroom. Students in the sixth semester will have to undergo at least 16 working weeks of full-time work under the supervision of a professional from Architecture or allied fields, gaining practical experience and theoretical understanding in specialized, discipline related electives of their choice. Students are adequately supervised and evaluated to ensure that the work experience is balanced with academics, and academic goals are met. Candidates opting for Co-operative Learning in the semester 6 shall attend a 'Co-op Prep' course during semester 5.

**15.1.3. Internship/ Practical training:**

Students will have to undergo at least 16 working weeks of internship in the ninth semester as per the norms laid by the Competent Regulatory Authority, India in an approved firm established not less than five years with a registered architect.

**15.1.4. Value Added Courses:**

To fulfill the requirements of the B.Arch. program a candidate is required to complete a minimum of 80 hours of Value-Added Courses in addition to the 240 credits mandated by the program.

15.1.4.1. Students must complete a minimum of 16 hours of Value-Added Courses to progress from Level 1 to Level 2, and 48 hours (including the courses taken in Level 1) to progress from Level 2 to Level 3.

15.1.4.2. Such courses may be offered by the Institute itself either during the semester or during vacations.

15.1.4.3. Students taking up Value Added Courses other than those offered by the Institute should seek prior approval from the Institute.

15.1.4.4. A student has to achieve 50% of marks or an equivalent grade to complete the Value-Added Courses.

**15.2. Electives:**

To fulfill the requirements of the B.Arch. program a candidate is required to complete a minimum of 24 credits of Elective courses included in the 240 credits mandated by the program.

15.2.1. A minimum number of ten\* candidates shall be required to offer and conduct an elective course.

\*At the discretion of the Institute/ University.

15.2.2. Type of Elective courses offered:

L2 Elective Courses: Courses that are offered to Level 2 students only

L3 Elective Courses: Courses that are offered to Level 3 students only

Elective Courses (Open): Courses that are offered to both Level 2 and Level 3 students

Elective Courses (Global): Courses that are offered by one of the constituent Institutes of the University to students of all students of the University.

15.2.3. Electives shall be offered at the discretion of the Institute.

15.2.4. Candidates may opt for no more than 6 elective credits per semester in semesters 3, 4, 5, and 8, and no more than 9 elective credits per semester in semesters 7 and 10. Candidates are advised against taking elective courses in semesters 6 and 9.

15.2.5. Only 24 credits of Elective courses will be considered towards the total of 240 credits mandated by the University.

15.2.6. Candidates opting to take more than the required 24 credits of Elective courses mandated by the University will be charged course fees for the extra credits.

**15.3. Teaching and learning methods**

The contents of the courses as listed in curriculum table shall be taught in an application-oriented manner on a scientific and design basis in a blended learning mode. The course contents shall be taught and learned in lectures, seminars, labs/ workshops, studio exercises and design projects, internships and study tours.

#### 15.3.1. Blended Learning

Blended learning is a combination of offline and online learning in a way that the one complements the other. This refers specifically to,

- 15.3.1.1. certain courses, modules within courses, or parts of modules that are designed to be taught online or as self-directed study,
  - 15.3.1.2. courses for which students are expected to register on the e-learning portal, and content shared therein,
  - 15.3.1.3. courses where certain components such as video conferencing, online evaluations including submissions, quizzes, tests etc., pre-recorded lectures, or digital material, are a part of the method of delivery.
- 15.3.2. Lectures are held to teach basic connections and the systemization of theoretical knowledge and the methodology of scientific work. Specific courses are presented in a well-structured form, incorporating new research results.
- 15.3.3. In Seminars the contents shall be taught in dialogue and discussion phases.
- 15.3.4. In labs/ workshops the contents of the course shall be delivered through hands on work and experiments.
- 15.3.5. In studio exercises the teachers shall take the lead to provide tasks and offer guidance for solutions finding. The students shall work either individually or in groups.
- 15.3.6. In design studios/ construction studios/ projects the students contribute to the processing, analysis and the solving of problems of direct professional practice, attended by faculty(s) entitled to conduct the studio and examine.
- 15.3.7. In Internship the students engage in work in an architectural practice/ government architecture departments and train specifically under architects registered with the Council.
- 15.3.8. Field Trip help to consolidate course contents by acquainting students not only with professional practice but also the culture and context of a region.
- 15.3.9. Research:  
Research requires a candidate to spend time surveying, investigating and evaluating a field of knowledge that culminates in a paper where the candidate presents their own interpretation, evaluation, or argument about a subject to thought fully offer a unique perspective on the issue.

### 16. Attendance

- 16.1.** A candidate shall study in the Institute for the entire period as a full-time student. No candidate may register for any other degree examination conducted by this University or any other University in India or abroad during the period of study without prior written consent from the University/ Institute.
- 16.2.** Each semester shall be taken as a unit for the purpose of calculating attendance.
- 16.3.** A candidate who has a minimum of 80% of attendance in each course separately and who has fulfilled other requirements of the program shall be permitted to appear for the respective University examinations.
- 16.4.** A candidate having shortage of attendance shall not be eligible to answer the University examination.

### 17. Examination and Assessment:

There shall be a University examination at the end of each semester.

**17.1. Scheme of Examination:**

Evaluation is based on formative evaluation (Continuous Internal Evaluation) and summative evaluation (Semester End Examination).

**17.1.1. Continuous Internal Evaluation (CIE)**

CIE is calculated on the basis of sessional evaluations such as Written Tests, Seminars, Juries, Quizzes, Assignment Reviews, Written Assignment Reviews and Time Problems. There shall be three periodic evaluations and the best two of the three periodic evaluations shall be considered for calculating the CIE marks.

A candidate must secure at least 50% of CIE marks in a particular course in order to be eligible to appear for the Semester End Examination of that course.

**17.1.2. Semester End Examination (SEE):**

A candidate who satisfies the requirements of attendance, CIE marks and conduct shall be eligible to appear for the University examinations. There shall be a University Examination at the end of each semester.

To be eligible to appear for the University examination in a particular course, a candidate should fulfill all the following conditions.

- a. Satisfy the requirements of the course for the prescribed duration;
- b. Secure at least 50% of total CIE marks in the course;
- c. Fulfil any other requirement that may be prescribed by the University from time to time.

**17.2. Assessment Procedure:**

The academic performance is assessed on the basis of both Continuous Internal Evaluation (CIE) and Semester End Examination (SEE) in each semester. CIE: SEE weightage will be in the ratio of 50:50.

**17.3. Criteria for Pass:**

A candidate is declared to have passed in a course, if they secure not less than 50% in the aggregate, i.e., total CIE and SEE put together, provided they secure a minimum of 50% of the marks separately in the Continuous Internal Evaluation (CIE), and each component (Review and Written Examination) of the Semester End Examination (SEE) prescribed for the course.

A candidate who fails in the Review or Written Examination of a course shall appear only for that part of the examination or for both as the case may be in the supplementary examination.

## 18. Academic Performance Evaluation:

### 18.1. Grading System:

The performance of a candidate shall be evaluated according to a Letter Grading System, based on both CIE and SEE, provided they pass CIE and SEE separately. The letter grades (O, S, A+, A, B, C, F & I) indicate the level of academic achievement assessed on a 10point scale (0 to10).

Marks Range (%)	Grade Point	Letter Grade	Descriptor
90 & above	10	O	Outstanding
80-89	9	S	Excellent
75-79	8	A+	Very Good
65-74	7	A	Good
60-64	6	B	Average
50-59	5	C	Pass
Below 50	0	F	Fails
Below 50	0	I	Absent

**18.1.1.** A candidate shall be considered to have completed a course successfully and earned the credits assigned, if they secure an acceptable letter grade in the range O-C. Letter grade 'F' in any course implies failure in that course and no credit is earned.

**18.1.2.** A candidate having satisfactory attendance at classes and meeting the passing standard at CIE in a course but remained absent from SEE shall be awarded 'I' grade in that course.

### 18.2. Grade Point Averages:

The overall performance of a candidate will be indicated by Grade Point Average (GPA). For each course, grade points will be awarded as per a letter grading system.

Semester Grade Point Average (SGPA) is computed as follows:

$$SGPA = \frac{\sum [(course\ credit) \times (Grade\ point)] \text{ for all courses with Letter grades, including F}}{\sum [(course\ credits)] \text{ for all courses with Letter grades, including F}}$$

Cumulative Grade Point Average (CGPA) is computed as follows:

$$CGPA = \frac{\sum [(course\ credit) \times (Grade\ point)] \text{ for all courses for all semesters with, Letter grades excluding F}}{\sum [(course\ credits)] \text{ for all courses for all semesters with Letter grades, excluding F}}$$

### 18.3. Conversion of Grades into Percentage:

Formula for conversion of GPA into percentage:

CGPA earned X10 = Percentage of marks scored

Illustration: (CGPA Earned 8.18 X 10) = 81.80 %

#### 18.4. Award of Class:

The candidate, who has earned 240 credits and 80 hours of Value-Added Courses, shall be declared to have passed the program. Class will be awarded on the basis of CGPA.

Classification	CGPA
I Class with Distinction	9.00 and above
	8.00-8.99
	7.50-7.99
I Class	6.00-7.49
II Class	5.00-5.99
Fails	Less than 5

- A candidate who secures  $CGPA \geq 7.50$  and above in all mandatory courses in the first attempt shall be declared to have passed in 'First Class with Distinction'.
- A candidate who secures  $CGPA \geq 6.00$  or more in all mandatory courses in the first attempt shall be declared to have passed in 'First Class'.
- A candidate who secures  $CGPA \geq 5.00$  or more but less than 5.99 in all mandatory courses in the first attempt shall be declared to have passed in 'Second Class'.
- Candidates who do not pass all mandatory courses in the first attempt shall be declared as passed in 'Pass' class irrespective of the percentage of marks secured.
- An attempt means the appearance of a candidate for one or more courses either in part or full in a particular examination.
- A candidate who fails in main examination and passes one or more mandatory subjects or all subjects in the supplementary examination is not eligible for award of class or distinction.
- If a candidate submits application for appearing for the regular examination but does not appear for any of the courses in the regular University examination, due to exceptional circumstances, they can appear for supplementary examination provided other conditions such as attendance requirement, internal assessment marks, etc. are fulfilled and their appearing in the supplementary examination may be considered as the first attempt at the discretion of the Director.
- Candidates who do not pass all the subjects in the first attempt are not eligible for the award of Gold Medal or Merit Certificate.

#### 18.5. Conditions for promotion:

- To progress from Level 1 to Level 2, the candidate should have successfully gained 38 Credits and completed a minimum of 16 hours of Value-Added Courses.
- To progress from Level 2 to Level 3, the candidate should have successfully completed all mandatory courses from semester 1 to semester 6, gained a minimum of 6 elective credits (excluding the 12 credits earned from the Cooperative Learning course), and completed a minimum of 48 hours of Value-Added Courses.
- To progress from semester 9 to semester 10, candidate should successfully pass in all mandatory courses in the previous semesters.

#### 18.6. Rules for Grace Marks:

Grace marks up to 1% of the maximum total marks in the examination or 10 marks whichever is less shall be awarded to the failed course(s), provided on award of grace marks the

candidate passes in that course(s)/ examination. There shall be no provision to award grace marks for improvement of class.

**18.7. Re-totaling:**

Re-totaling of marks is permitted only for written examination. The University, on application within the stipulated time and remittance of a prescribed fee, shall permit a recounting of marks for the course/s applied. The marks obtained after re-totaling shall be the final marks awarded.

**19. Supplementary Examinations:**

Supplementary examination shall be conducted by the University for the benefit of unsuccessful candidates. Supplementary examinations will be conducted within six weeks from the date of announcement of results for courses of the current semester.

- A candidate will only be allowed one regular attempt and one supplementary attempt for any course in a given academic year.
- A candidate detained for lack of attendance and/or CIE marks will be barred from appearing in the supplementary examination for the respective course.
- A candidate dropping from appearance in any or all courses at regular examination is disallowed from taking dropped course(s) at the supplementary examinations.
- If a candidate submits application for appearing for the regular examination but does not appear for any of the courses in the regular university examination, due to exceptional circumstances, they can appear for supplementary examination provided other conditions such as attendance requirement, CIE marks, etc. are fulfilled and their appearing in the supplementary examination may be considered as the first attempt at the discretion of the University.

**20. Award of Merit Certificates:**

Merit Certificates will be awarded on the basis of overall CGPA of 1 to 10 semester examinations. Further, only those candidates who have completed the program and fulfilled all the requirements in the minimum number of years prescribed (i.e., five years) and who have passed each semester in the first attempt are only eligible for the award of Gold Medal and Merit Certificates.

\*\*\*\*\*

## **SYLLABUS**

**B.Arch.**

**Nitte Institute of Architecture**

## PROGRAM OUTCOMES

**PO1 Understand:** Knowledge of the architect's role in the construction industry, in society, and the professional qualities required for the practice of architecture.

**PO2 Communicate:** Ability to determine appropriate communication methods and media to test, analyse, critically appraise and explain ideas clearly and effectively.

**PO3 Apply:** Ability to integrate the humanities, the social and the physical sciences, technology, environmental sciences, the creative arts, and the liberal arts in the building construction process to generate workable and sustainable architectural design solutions.

**PO4 Apply:** Capacity to develop a design program, and to be able to conceptualise, design, understand and realise the act of building within a context of the practice of architecture which balances the tensions between emotion, reason and intuition, and which gives physical form to the needs of society and the individual.

**PO5 Analyse:** Knowledge of the history and theories of architecture and the related arts, technologies and human sciences, and their influence on the spatial, social, and technological aspects of architecture.

**PO6 Evaluate:** Critical thinking and problem solving, professional judgement, and ability to take the initiative and make appropriate decisions, prioritising resilience, ecological sustainability, and design for reduced use of energy, as well as passive systems and their management.

**PO7 Create:** Ability to evaluate evidence, arguments and assumptions in order to make and present sound judgments within a structured discourse, and produce clear, logically argued and original work relating to architectural culture, theory and design.

**SEMESTER 1 (LEVEL 1)**

Courses of Study and Training					Scheme of Examination						
S. No	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR 11	Foundation Studio	12	12	1200	600	600	300	300	-	-
2	20BAR 12	Culturescapes	3	3	300	150	150	75	75	-	-
3	20BAR 13	Environment and Building Physics	6	6	600	300	300	150	150	-	-
4	20BAR 14	Architectural and Visual Representation	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

**Semester 1  
Foundation Studio**

**Course Code: 20BAR11**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The primary focus of the foundation studio is on building fundamental design skills. It introduces design as a conceptual discipline, directed towards a creative problem-solving process, through structured methods of analysis, interpretation, synthesis, & transformation of the physical environment. It fosters aesthetic sensitivity through exploring design theories and conceptual thinking. It augments critical thinking for design innovation, by dwelling into other liberal art forms. It emphasizes a system of learning by making, and hands-on experience, towards the development of creative and traditional skills, by experimenting and exploring through various materials. The Human Body becomes a point of reference for all the design explorations in this studio.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Portfolio/ Viva		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	4	6	12	600	600	1200	300	300	-	-
Per semester	30	60	90	180							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	Able to associate and express the relationship of Body with Object
<b>Remember</b>	<b>CO2</b>	Able to define the interrelationship of form, structure, and material in a natural and man-made object
<b>Analyse</b>	<b>CO3</b>	Able to conceptualize architectural ideas by deducing from design theory and other liberal art forms
<b>Create</b>	<b>CO4</b>	Able to generate design through structured conceptual ideas
<b>Apply</b>	<b>CO5</b>	Able to use drawings and physical models to conceive, organize and develop an Object.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	—	—	—	—	—	—	—	Unrelated
CO2	1	—	1	—	2	—	—	1	Indirectly Related
CO3	-	-	1	—	2	—	2	2	Directly Related
CO4	1	—	—	2	—	—	—		
CO5	—	-	-	—	1	2	2		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Lecture</b>	1.1	Understand	CO2	Introduction to Structures and patterns in nature	Class exercise/ Self-directed study/ Lecture	<b>30</b>
	1.2	Understand	CO2	Introduction to Proportioning Systems and Aesthetics of Form and Structure		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.3	Understand	CO2	Structure and Form Experimental Theory		
	1.4	Remember	CO2	Material Ecology and Production of Form		
	1.5	Understand	CO1	Ergonomics, Material and Aesthetics in Design		
2. Studio	2.1	Analyse	CO2 and CO5	Investigating Qualitative and Quantitative aspects of Structure and Pattern in natural object using Scaled Drawings and models	Research/ Workshop/ Studio	60
	2.2	Apply	CO2 and CO5	Exploration of Form through inter-relationship of Materials and Structure		
	2.3	Create	CO3, CO4 and CO5	Elementary Study of Form		
	2.4	Create	CO1, CO3, CO4 and CO5	Introduction to Human Anthropometrics and Designing of object in relation to the body		
3. Workshop	3.1	Remember	CO2 and CO5	Study of Materials, Tools and Joinery between one or more material	Research/ Workshop/ Studio	90
	3.2	Understand	CO5	Preparing Drawings for Fabrication		
	3.3	Remember	CO5	Hands-on and Digital Process of Fabrication and Installation		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	30	120	Review (Portfolio/ Digital Portfolio/ Report)	120
	1.2					
	1.3					
	1.4					
	1.5					
2. Studio	2.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	60	240	Review (Portfolio/ Digital Portfolio/ Report)	240
	2.2					
	2.3					
	2.4					
3. Workshop	3.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	90	240	Review (Portfolio/ Digital Portfolio/ Report)	240
	3.2					
	3.3					

**References**

1. Stevens, Peter S. 1977. Patterns in nature. Harmondsworth: Penguin Books.
2. Otto, Frei, Philip Kurz, Martin Kunz, Joachim Kleinmanns, and Georg Vrachliotis. 2016. Frei Otto: thinking by modeling.
3. Drew, Philip. 1976. Frei Otto Form and Structure. Boulder, Colo: Westview Press.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester I**  
**Culturescapes**

**Course Code: 20BAR12**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course comprises three key social, cultural, and political factors that underpin civilisation – faith, power, and commerce. Faith is made manifest through architecture, power actively shapes the built environment, and commerce acts as a catalyst to the growth of societies.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	0	1	3	150	150	300	75	75	-	-
Per semester	30	0	15	45							

**Course Outcomes**

Domain/ Level	Outcomes	
Understand	CO1	Students will recognize religion as a generator of architectural traditions.
Understand	CO2	Students will identify the role of patronage in the creation of cultural fabric.
Apply	CO3	Students will examine the diverse architectural impacts of trade and conquest leading to new architectural programs, new building types, the formation of cosmopolitan and or port towns, & shifts in domestic architecture. They will also discuss the reverse flow of ideas from the conquered territories to other places within the established networks.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	—	1	1	-	-	-	—	Unrelated
CO2	1	2	1	1	1	-	-	1	Indirectly Related
CO3	-	—	2	2	1	1	1	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	Students will explore Religion as a generator of architectural traditions. By examining various built examples, they will understand the connections between symbolism in religious architecture.	Class exercise/ Self- directed study/ Research/ Lecture	30
	1.2	Understand	CO2	Students will learn the role of Power or Patronage in the creation of culture of and for a people.		
	1.3	Understand	CO3	Students will understand the role of trade networks and patrons in generating and propagating architectural styles at particular moments in history which eventually get tagged as explicitly pertaining to a particular religion.		
	1.4	Understand	CO3	Be able to understand historical-theoretical writings at a advanced level.		
2. Workshop/ Fieldwork	2.1	Apply	CO3	Student will do exercises to understand the integrated influence of the three parameters.	Class exercise/ Self- directed study/	15
	2.2	Evaluate	CO3	Conduct Social Survey of any historic cities/cities to examine the existence of Faith, power and commerce in community.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.3	Create	CO3	students will be able to create a comparative chart to see the variation in the three parameters	Research/ Lecture/ Fieldwork	
	2.4	Apply	CO3	By examining various built examples, they will understand the connections between symbolism in religious architecture.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Jury/ Assignment review/ Written assignment review	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	1.2					
	1.3					
	1.4					
2. Workshop	2.1	Seminar/ Jury/ Assignment review/ Written assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
	2.3					
	2.4					

**References**

1. Mcadams, Michael a., Jesus Trevino Cantu, and Ivani Vassoler-froelich. 2012. The Geography, Politics, and Architecture of Cities: Studies in the Creation and Complexification of Culture. Lewiston, N.Y.: Edwin Mellen Press.
2. De Landa, Manuel. 2019. A Thousand Years of Nonlinear History. New York: Zone Books.
3. Kostof, Spiro. 2010. A History of Architecture: Settings and Rituals. New York: Oxford University Press.
4. Roth, Leland M., and Amanda C. R. Clark. 2018. Understanding Architecture: Its Elements, History, and Meaning. Routledge.

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**Semester 1**  
**Environment and Building Physics**

**Course Code: 20BAR13**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

A foundation-level course, introducing the fundamentals of ecology, environment, and sustainability. The course introduces the process of site exploration, the use of natural materials, and construction methodologies to be adopted for substructures. This course gives an understanding of building physics and introduces the concept of structural systems in the field of architecture. The course also identifies the natural and renewable sources and recognizes the sustainable energy practices applicable for built environments.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	2	2	6	300	300	600	150	150	-	-
Per semester	30	30	30	90							

**Course Outcomes**

Domain/ Level	Outcomes	
Analyse	CO1	To comprehend the importance of the natural environment, identify the issues concerned with it, and further develop an understanding of designing built forms with nature.
Create	CO2	Understand the evolution of primary building materials and be able to use these natural materials to create sustainable built environments that will adapt themselves to the surrounding environment.
Apply	CO3	The overall basics of building construction and technology by familiarizing in detail - the process of building construction, building components, various materials, skills, and types of equipment used in making them.
Analyse	CO4	The Structural components, Geometrical properties, Force systems, Equilibrium conditions, Loads & Basic stresses determine the principles of structural systems as an integral part of the architecture.
Apply	CO5	Develop an understanding of traditional systems of services provided for settlements, develop sensitivity towards sustainable energy resources, materials, and their application in constructions.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	1	2	2	2	-	1	—	Unrelated		
CO2	-	—	2	2	-	-	2	1	Indirectly Related		
CO3	-	-	2	2	1	1	2	2	Directly Related		
CO4	1	-	1	1	2	2	—				
CO5	-	-	2	2	1	-	1				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Environmental	1.1	Understand	CO 1	Introduction to Ecology - Understand ecosystems their types, components and functions, Understand the importance of Biodiversity, and that humans are part and parcel of the ecosystem.	Class exercise/ Self- directed study/ Research/ Lecture	15
	1.2	Understand	CO 1	Develop an all-inclusive understanding of the environmental concerns, resource issues and the effects of human interventions and buildings on the environment.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.3	Understand	CO1	Introduction to climate classification systems and the role of natural environment in shaping built forms		
	1.4	Understand	CO1	Understanding the role of the natural environment in shaping the built forms in different climates		
	1.5	Understand	CO 1	Understanding the role of the natural environment in shaping the built form in terms of building materials, building typology and unique characteristics of buildings based on local climate and environment.		
2. Materials	2.1	Understand	CO 2	Evolution, composition, properties and extraction of primary building materials (Earth, stone, brick)	Class exercise/ Self- directed study/ Research/ Lecture	15
	2.2	Understand	CO 2	Process of manufacture, standard properties and utilization of bricks		
	2.3	Understand	CO 2	Origin, classification, extraction and applications of timber as a building material		
	2.4	Understand	CO 2	The properties, extraction, applications of natural materials (e.g. : Bamboo, cane) in creating sustainable built environments		
3. Construction	3.1	Understand	CO 3	Introduction to masonry wall construction using bricks and stone	Class exercise/ Self- directed study/ Research/ Lecture	22.5
	3.2	Understand	CO 3	Introduction to types of brick bonds and stone masonry and detailing up to the plinth level.		
	3.3	Understand	CO 3	Introduction to foundations in brick and stone masonry and its details		
	3.4	Apply	CO 3	Introduction to timber joineries its uses and details (part of workshop)		
4. Structures	4.1	Understand	CO 4	Equilibrium: Equations of equilibrium, examples of equilibrium	Class exercise/ Self- directed study/ Research/ Lecture	22.5
	4.2	Understand	CO 4	Forces: Force systems: coplanar & Non-coplanar, Collinear, concurrent, parallel, non-concurrent, non-parallel		
	4.3	Understand	CO 4	Introduction to building components & Structures; Sub-Structure: foundations, types of foundations. Super structure: Supports, columns, beams, slabs		
	4.4	Understand	CO 4	Site Explorations: Methods, Types of soil, Properties of soil		
	4.5	Understand	CO 4	Bearing capacity of soil, Settlements in foundation, Factors deciding depth of foundation		
5. Services	5.1	Understand	CO1, CO3, CO5	Discuss the functional requirements of a building, building services as the dynamics in a static structure, providing movement, communications, facilities and comfort	Class exercise/ Self- directed study/ Research/ Lecture	15
	5.2	Understand	CO1, CO5	Recognise the traditional systems of services provided for settlements		
	5.3	Understand	CO1, CO5	Identify the natural and renewable sources of Water, Energy, Lighting and Ventilation		
	5.4	Understand	CO1, CO5	Recognise the sustainable energy practices applicable for built environments		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	1.2					
	1.3					
	1.4					
	1.5					
2. Materials	2.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
	2.3					
	2.4					

<b>3. Construction</b>	3.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review	22.5	75	Review (Portfolio/ Digital Portfolio/ Report)	75
	3.2					
	3.3					
	3.4					
<b>4. Structures</b>	4.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review	22.5	75	Review (Portfolio/ Digital Portfolio/ Report)	75
	4.2					
	4.3					
	4.4					
	4.5					
<b>5. Services</b>	5.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	5.2					
	5.3					
	5.4					

### References

#### Environmental

1. McHarg, Ian L. 2005. Design with nature. New York: John Wiley & Sons.
2. Odum, Eugene P., and Gray W. Barrett. 2009. Fundamentals of ecology. Australia: Cengage Learning.
3. Berge, Bjorn, Chris Butters, and Filip Henley. 2010. The ecology of building materials. Milton Keynes UK.: Lightning Source UK.

#### Materials

4. Rangwala,, S.C. , 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
5. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

#### Construction

6. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead.
7. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.
8. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).
9. Cowan, Henry J., and Peter R. Smith. 2004. Dictionary of architectural and building technology (Latest edition).

#### Structures

10. Salvadori, Mario, Robert A. Heller, and Deborah Oakley. 2017. Salvadori's structure in architecture: the building of buildings.
11. Schodek, Daniel, Martin Bechthold, Daniel Schodek, and Daniel Schodek. 2014. Structures. Harlow: Pearson.

#### Services

12. Hall, Fred, and Roger Greeno. 2015. Building services handbook. Abingdon: Routledge
13. Kothari. 2011. Renewable energy sources and emerging technologies. [Place of publication not identified]: Prentice-Hall of India Pv.
14. Boyle, G. 1996. "Renewable Energy: Power for a Sustainable Future". JOURNAL OF ENERGY LITERATURE. 2 (2): 106-107.
15. Hodge, B. K. 2010. Alternative energy systems and applications. Hoboken (N.J): J. Wiley & Sons.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 1**  
**Architectural and Visual Representation**

**Course Code: 20BAR14**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course focuses on principles and experience of drawing and representation through hand constructed and computer-generated techniques. It will develop and deepen observation skills and methods for registering and representing those observations, through series of rigorous exercises. Documentation, compilation, analysis and presentation will remain integral structure of all the exercises. Emphasis on the control, precision, and rigor of the geometric description of form. Focusing on drawing in a variety of media; questions of figuration and abstraction, space and form, perception, and composition will be investigated.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	1	-	2	3							
Per semester	15	-	30	45	150	150	300	75	75	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Remember</b>	CO1	Document an object or system of the object through continuous drawing using manual and analogue techniques of drawings
<b>Apply</b>	CO2	Explain the working or the make of an object or system of objects.
<b>Apply</b>	CO3	Represent the working or the make of an object or system of objects.
<b>Analyse</b>	CO4	Develop an individual palette for the representation of a range of man-made and natural materials. Categorize and further compare them according to their potential use in various scales and the nature of the presentation.
<b>Create</b>	CO5	Build own format and list of drawings and estimate the scale of an object or structure.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	2	—	—	—	—	—	—	Unrelated
CO2	—	—	2	2	—	-	—	1	Indirectly Related
CO3	—	-	2	2	—	—	—	2	Directly Related
CO4	1	-	2	2	1	2	1		
CO5	1	2	—	—	1	2	2		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Remember	CO1	Introduction to role of Drawing as tool in Architecture	Class exercise/ Self- directed study/ Lecture	15
	1.2	Understand	CO1	Identify various mode of drawings to document an object or system of objects		
	1.3	Remember	CO3	Fundamentals of Graphics, Colour Theory, Typography, Composition		
	1.4	Analyse	CO4	Process of categorisation of elements in drawings as per the purpose of presentation		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Workshop/ Fieldwork	2.1	Apply	CO1	Physically document an object or systems of object using various types and methods of drawing by measuring it	Research/ Fieldwork/ Studio	30
	2.2	Apply	CO2 and CO3	Preparing set of drawings to help explain working or make of an object or system of objects.		
	2.3	Create	CO5	Representing developed set of drawings using computational and manual techniques		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Jury/ Assignment review/ Written assignment review/ Time problem	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	1.2					
	1.3					
	1.4					
2. Workshop/ Fieldwork	2.1	Jury/ Assignment review/ Written assignment review/ Time problem	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	2.2					
	2.3					

**References**

1. Atelier Bow-Wow, and Yoshiharu Tsukamoto. 2014. Graphic Anatomy. Tokyo: TOTO Publishing
2. Atelier Bow-Wow, Yoshiharu Tsukamoto, and Momoyo Kaijima. 2014. Graphic Anatomy 2. Tokyo: TOTO Publishing
3. Fletcher, Alan. 2013. The Art of Looking Sideways. London: Phaidon.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**SEMESTER 2 (LEVEL 1)**

Courses of Study and Training					Scheme of Examination						
S. No	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext	Marks	Duration of Exam
1	20BAR 21	Introduction to Architectural Design	12	12	1200	600	600	300	300	-	-
2	20BAR 22	Architecture and Change	3	3	300	150	150	75	75	-	-
3	20BAR 23	Climate, Site and Superstructure	6	6	600	300	300	150	150	-	-
4	20BAR 24	Graphics and Communication	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

**Semester 2**  
**Introduction to Architectural Design**

**Course Code: 20BAR21**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Foundation Studio

**Course Description**

The studio focuses on building essential forms and space-making skills. It explores fundamental concepts of proportion, scale, geometry, circulation, spatial expression, frames of reference, and the user. It orients students towards understanding the relationship of design with the environment, culture, human senses, and social life. To enrich their knowledge and sensitivity towards traditional settlements and human habitats, the students participate in field trips and documentation. To equip them with skills related to documentation, knowledge related to the principles of surveying and levelling is imparted as a part of this studio.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	6	4	12							
Per semester	30	90	60	180	600	600	1200	300	300	-	-

**Course Outcomes**

Domain/Level	Outcomes	
Apply	CO1	To demonstrate through design the relationship between form, shape, proportion, material, place, scale geometry, circulation, spatial expression, frame of reference, and the user.
Analyse	CO2	To be able to assess design problems and develop architectural questions that lead towards a critical outlook in design and emphasize sensitivity towards physical and social context.
Analyse	CO3	Demonstrate design ability that integrates Spatial, Structural, Material, Contextual and Visual design through a structured Design process and express through various mediums like drawing, models, etc.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	—	2	2	1	1	1	—	Unrelated
CO2	-	—	2	2	2	1	2	1	Indirectly Related
CO3	1	1	1	1	2	2	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Analyse	CO2	To analyse the concept of architectural theory as an analytical tool for investigating specific intrinsic qualities and underlying ideas within a built-environment	Class exercise/ Self-directed study/ Lecture	30
	1.2	Understand	CO3	Ability to recognize abstraction and distinguish between the various 'dimensions' that are embodied within Form-Space		
	1.3	Analyse	CO2	To analyse interventions which reflect context-responsive concepts and understanding of critical analysis of the built environment.		
	1.4	Analyse	CO2	To analyse how societies engage with architecture and its applied forms		
	1.5	Apply	CO2	To critically analyse self-work and reflect on it objectively		
2. Studio	2.1	Remember	CO2	To be able to establish clarity through logical thinking. That is the clarity of the logic behind Architectural composition, the quality that one recognises through reason.	Research/ Studio	90

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.2	Apply	CO1	To recognize and describe the forces or ideologies that shape form, space, structure and their organizational pattern		
	2.3	Apply	CO1 & CO3	To recognize synthesis between form, site and program and demonstrate the process of architectural form and space making through experience of phenomena.		
	2.4	Create	CO1 & CO3	To stretch limits of imagination and break away from the traditional preconceived notions of 'Buildings'; Explore unchartered territories and create personal expression to connect Man with Man and Man with Nature with architecture as the intermediary.		
	2.5	Create	CO3	To produce drawings and physical models to conceive, organize and develop habitable, three-dimensional space		
3. Workshop/ Fieldwork	3.1	Understand	CO3	To apply skills and techniques of Surveying to analyse and document site topography.	Workshop/ Self-directed study/ Fieldwork	60
	3.2	Understand	CO3	Characteristics of contours, direct and indirect methods of contouring, interpolation, uses of contours.		
	3.3	Apply	CO3	To demonstrate the setting out procedures for buildings		
	3.4	Understand	CO2	To be able to observe and perceive the world around them and to explore the possibilities of architecture through drawing		
	3.5	Apply	CO2	To document a settlement in detail with including its planning, zoning, typical house, lifestyle, culture, and construction techniques		
	3.6	Analyse	CO2 & CO3	To analyse how different contexts engage with and apply various forms of architecture, through interaction with communities, documentation and mapping exercises		

#### Scheme of Evaluation

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	1.2					
	1.3					
	1.4					
	1.5					
2. Studio	2.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	90	300	Review (Portfolio/ Digital Portfolio/ Report)	300
	2.2					
	2.3					
	2.4					
	2.5					
3. Workshop/ Fieldwork	3.1	Seminar/ Jury/ Assignment review/ Written assignment review/ Time problem	60	200	Review (Portfolio/ Digital Portfolio/ Report)	200
	3.2					
	3.3					
	3.4					
	3.5					
	3.6					

#### References

- Banham, Reyner. 2014. The Architecture of the Well-Tempered Environment. Kent: Elsevier Science
- Banham, Reyner. 2002. Theory and design in the first machine age. Oxford: Architectural Press.
- Pandya, Yatin. 2014. Elements of space making. Ahmedabad: Mapin Pub.
- Pandya, Yatin. 2013. Concepts of space in traditional Indian architecture. Ahmedabad: Mapin Publishing.
- Indira Gandhi National Centre for the Arts. 1986. Space and the Act of Space. New Delhi: Rabindra Bhavan.
- Vistara: The Architecture of India, Exhibition Catalogue. Festival of India, 1986.
- Zumthor, Peter. 2006. Atmospheres: architectural environments, surrounding objects. Basel: Birkhäuser.
- Ching, Francis D.K. 2014. Architecture Form, Space, and Order. John Wiley & Sons Inc.
- Clark, Roger H., Pause, Michael. 2012. Precedents in Architecture: Analytic Diagrams, Formative Ideas, and Partis. United Kingdom: Wiley.

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**Semester 2**  
**Architecture and Change**

**Course Code: 20BAR22**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The course focuses on the major social, cultural, political, economic, technological, and environmental shifts in human history, to understand the impact that these changes exert on architecture and the built environment. It identifies the key theories that led to some of these changes and correlates them with adaptations in the built form of the time. It studies how architecture has been influenced by contemporaneous movements in art and design. It charts the rise and decline of civilizations across space and time, to better understand the factors that lead to specific changes, see how people have dealt with change in the past, and use this knowledge to design for the future.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	-	1	3	150	150	300	75	75	-	-
Per semester	30	-	15	45				-	-		

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	CO1	List the major social, cultural, political, economic, technological, and environmental shifts in human history. Further, describe and estimate their impact on architecture and the built environment.
<b>Analyse</b>	CO2	Identify the key theories, writings, and paradigm shifts that lead to changes, correlate this with adaptations in the built form of the time, and understand how architecture has been influenced by contemporaneous movements in art and design.
<b>Apply</b>	CO3	Chart the rise and decline of civilizations across space and time, to better understand the factors that lead to specific changes, see how people have dealt with change in the past, and use this knowledge to design for the future.

**Course Outcomes – Program Outcomes Mapping**

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	2	-	—	1	1	1	—	Unrelated
CO2	1	1	1	1	2	1	2	1	Indirectly Related
CO3	—	—	—	2	2	1	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture/ Seminar	1.1	Remember	CO1	Identifying the major social, cultural, political, economic, technological, and environmental shifts in human history.	Class exercise/ Self- directed study/ Lecture	45
	1.2	Understand	CO1	Understanding the impact of social, cultural, political, economic, technological, and environmental changes on architecture and the built environment.		
	1.3	Understand	CO2	Comparing developments in architecture with influences from contemporaneous movements in art and design.		

	1.4	Analyse	CO2	Identifying the key theories, writings, paradigm shifts, that lead to changes, and correlating them with adaptations in the built form of the time.		
	1.5	Analyse	CO3	Charting the rise and decline of civilizations across space and time, to better understand the factors that lead to specific changes, see how people have dealt with change in the past, and use this knowledge to design for the future.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture/ Seminar	1.1	Written test/ Seminar/ Jury/ Quiz/ Assignment review/ Written assignment review*	45	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	1.2					
	1.3					
	1.4					
	1.5					

\*Mandatory Written Essay component for at least one Unit.

**References**

1. Conrads, Ulrich. 1971. Programs and Manifestoes on 20th-Century Architecture. MIT Press.
2. Kleiner, Fred S. 2015. Gardner's Art through the Ages: A Global History, Volume I. Cengage Learning.
3. Kleiner, Fred S. 2015. Gardner's Art through the Ages: A Global History, Volume II. Cengage Learning.
4. Kostof, Spiro. 1999. The City Shaped: Urban Patterns and Meanings Through History. Thames & Hudson.
5. Kostof, Spiro. 2010. A History of Architecture: Settings and Rituals. New York: Oxford University Press.
6. Mallgrave, Harry Francis. 2006. Architectural Theory. Wiley.
7. Mallgrave, Harry Francis, 2009. Modern Architectural Theory: A Historical Survey, 1673–1968. Cambridge University Press.
8. Mallgrave, Harry Francis, and David J. Goodman. 2011. An Introduction to Architectural Theory: 1968 to the Present. Wiley.
9. Roth, Leland M. 2018. Understanding Architecture: Its Elements, History, and Meaning. Routledge.
10. Thapar, Romila. 2004. Early India: From the Origins to AD 1300. University of California Press.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 2**  
**Climate, Site and Superstructure**

Course Code: 20BAR23

Credits: 6

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course aims to cover the various climates and their implications for building design in the respective climates. Building materials like lime and gypsum, binding materials, damp proofing as well as termite proofing are introduced in this course. Construction methods and detailing of various building components such as arches, lintels, openings, flooring, and roofing are also explained. Principles related to the strength of materials and load patterns are discussed in this course. Implementation of the passive approaches to the building design and development of an energy-efficient built environment is also demonstrated.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written Exam		
								Int.	Ext.	Marks	Duration of Exam	
Per week	2	2	2	6								
Per semester	30	30	30	90	300	300	600	150	150	-	-	

**Course Outcomes**

Domain/ Level	Outcomes	
Analyse	CO1	To appraise the use of various tools to interpret climatic data with thermal comfort conditions and be able to apply passive design strategies for a particular site and develop building design.
Apply	CO2	To define and develop knowledge on the materials used in the treatment and finishes of building components, and be able to apply the various contemporary and traditional techniques of these materials in building construction.
Apply	CO3	To comprehend the main components of a building, and the characteristics, specifications, functionality, and practicality of each component in detail for application.
Understand	CO4	To recognize the various methodologies of site explorations, types of soil, properties, and foundations, and be able to define the load path, load-bearing walls, material properties, and application of loads to analyse the behaviour of elements - Bending moments & Shear force
Create	CO5	To define and recognize the strategies used for the passive design of energy-efficient buildings in different climatic conditions that bring a paradigm change in the architectural design field

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:				
CO1	1	—	2	2	2	2	2	—	Unrelated			
CO2	1	—	2	2	1	-	2	1	Indirectly Related			
CO3	-	—	2	2	—	—	1	2	Directly Related			
CO4	2	—	—	—	1	—	—					
CO5	1	—	2	2	2	2	2					

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Environmental	1.1	Remember	CO 1	Understand the fundamental concepts of building physics and passive design and its benefits on the built form.	Class Exercise/ Research/ Lecture	15
	1.2	Understand	CO 1	Understand the climatic factors that need to be considered while designing a building to achieve better human comfort.		
	1.3	Understand	CO 1	Understand the factors influencing the thermal comfort in the built environment, and use bioclimatic charts, etc. to understand how thermal conditions can be modified.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.4	Analyse	CO 1	Understand contemporary and traditional daylighting techniques and implement them in design to reduce energy consumption		
	1.5	Apply	CO 1	Understand passive cooling and heating systems and develop building design by implementing these strategies, design features and determining the proper orientation of the building envelope in a particular geographical context		
2. Materials	2.1	Remember	CO 2	Properties of lime, types and application in the design of finishes.	Research/ Fieldwork/ Workshop/ Lecture/ Studio	15
	2.2	Remember	CO 2	Properties, products of gypsum and its prominent applications in building construction		
	2.3	Understand	CO 2	Contemporary and traditional techniques of damp and termite proofing and materials used for such treatments.		
	2.4	Analyse	CO 2	Properties, composition and types of Mortar as a bonding agent between building materials and its application in various construction phases.		
3. Construction	3.1	Remember	CO 3	Introduction to Arches, brief history, types of arches and construction methods e.g.: Flat arches, Moorish Arches, Semi-circular arch, equilateral arches etc.	Fieldwork/ Workshop/ Lecture/ Studio	22.5
	3.2	Understand	CO 3	Construction of lintels and sills using brick and stone.		
	3.3	Understand	CO 3	Doors and its types. E.g.: single leaf, double leaf. Understand different types of timber doors, its characteristics and construction details e.g.: flush door, panelled doors, glazed doors, ledged, battened and braced door, fly proof door.		
	3.4	Understand	CO 3	Introduction to wooden windows and its types and construction details - casement windows, louvered windows, ventilators		
	3.5	Understand	CO 3	Introduction to sloped roofs with timber truss systems, Gain knowledge on the types of sloped roofs like Gabled, Hipped, Lean - to and understand the main types of timber truss systems and its construction details with tiles and battens.		
	3.6	Understand	CO 3	Introduction to Flooring, understanding different types of flooring like : wooden flooring , PCC , terrazzo etc.		
4. Structures	4.1	Understand	CO 4	Loads: Dead Load, Live Load, Wind Load, Earthquake Load, snow, Thermal, settlement loads, Gradually applied & Suddenly applied loads	Fieldwork/ Workshop/ Lecture/ Studio/ Seminar	22.5
	4.2	Understand	CO 4	Load path, Load transfer, load bearing walls, factors influencing compressive strength of masonry		
	4.3	Understand	CO 4	Basic Stress States: Simple Tension, Compression, Bending, Shear & Torsion		
	4.4	Understand	CO 4	Material properties: Young's modulus, Rigidity modulus, Bulk Modulus, Shear Modulus		
	4.5	Understand	CO 4	Strength of materials: Bending Moments & Shear force		
5. Services	5.1	Understand	CO1, CO5	Explain the types of building services and passive systems and strategies associated with the built environment which ensures energy efficiency	Research/ Fieldwork/ Workshop/ Lecture/ Studio/ Seminar	15
	5.2	Apply	CO1, CO5	Execute the environmental approaches to the site planning, design, and development of a built environment		
	5.3	Apply	CO1, CO5	Implement the passive approaches to the building design, and development of a built environment		
	5.4	Apply	CO1, CO5	Use of rain water harvesting strategies, daylighting strategies, passive heating and cooling systems		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	1.2					
	1.3					
	1.4					
	1.5					
2. Materials	2.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
	2.3					
	2.4					
3. Construction	3.1	Seminar/ Jury/ Assignment review	22.5	75	Review (Portfolio/ Digital Portfolio/ Report)	75
	3.2					
	3.3					
	3.4					
	3.5					
	3.6					
4. Structures	4.1	Seminar/ Jury/ Assignment review	22.5	75	Review (Portfolio/ Digital Portfolio/ Report)	75
	4.2					
	4.3					
	4.4					
	4.5					
5. Services	5.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	5.2					
	5.3					
	5.4					

**References**
**Environmental and Services**

- Givoni, Baruch. 1969. Man, climate, and architecture, Elsevier Publishing Company Limited.
- Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A., Szokolay, S. V., 1973. Manual of Tropical Housing and Building Part 1. Climatic Design, Orient Longman Pvt. Ltd.
- Krishnan, A. (ed.), Baker, N., Yannas, S., Szokolay, S., 2001. Climate Responsive Architecture – A Design Handbook for Energy Efficient Buildings, Tata McGraw-Hill Publishing Company Limited, New Delhi.
- Majumdar, Mili (ed.), 2001. Energy Efficient Buildings in India, Tata Energy Research Institute and Ministry of Non-conventional Energy Sources, Government of India.
- Ander, G. D., 2003. Daylighting Performance and Design (Latest edition), John Wiley & Sons Inc., New Jersey.
- Crosbie, M. J., 1998. The Passive Solar Design and Construction Handbook, John Wiley & Sons Inc., New York.

**Material**

- Rangwala, S.C. , 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
- Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

**Construction**

- McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead.
- Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.
- Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).

**Structures**

- Bhavikatti, SS. Strength of Materials (For Polytechnic Students) (Latest edition). N.p.: Vikas Publishing House.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to

**Semester 2**  
**Graphics and Communication**

**Course Code: 20BAR24**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Architectural and Visual Communication

**Course Description**

This Course advances the documentation method using a range of mediums and mapping techniques further deepening observation skills. It fosters the use of mixed media techniques to effectively communicate complex data. It will also explore various mediums of visual communication not just to express or represent spatial concepts but to use them as design tools and translate ideas between distinct mediums. Analytical readings of form, structure, space, program, and site will be explored. Students to achieve the ability to critically interpret architectural precedents through analytical representation. The focus will also be on various techniques and methods of producing architectural images including photography, rendering, animation, and pixel manipulation. In addition to exposing students to advanced imaging methods, questions of aesthetics, composition, colour theory and optical mechanics will be explored concerning architectural representation.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	1	0	2	3							
Per semester	15	0	30	45	150	150	300	75	75	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Remember</b>	CO1	Document a work of architecture and place, with its various aspects, using drawings and other modes of documentation (Videography, mapping techniques, etc.)
<b>Understand</b>	CO2	Describe and express various layers of a work of architecture and place. Further, visualize using various mediums of communications.
<b>Evaluate</b>	CO3	Demonstrate various layers of a work of architecture and place using various mediums of communications
<b>Apply</b>	CO4	Identify, illustrate, construct, and communicate thoughts graphically

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	2	1	1	—	—	—	—	Unrelated
CO2	2	—	—	—	1	—	—	1	Indirectly Related
CO3	—	-	1	—	2	—	—	2	Directly Related
CO4	—	-	2	2	1	1	1		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Lecture</b>	1.1	Remember	CO1	Introduction to different mode of Documentation	Class exercise/ Self- directed study/ Lecture	<b>15</b>
	1.2	Understand	CO3	Introduction to mixed media techniques		
	1.3	Apply	CO2 and CO3	Process and techniques of presenting mapped and Analysed data.		
	1.4	Apply	CO4	Conceptualizing through drawings and other modes of graphical communications		
	1.5	Evaluate	CO4	Design development through drawings and supporting modes of communication		
	1.6	Create	CO3	Presenting an Architectural Scheme		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Workshop/ Fieldwork	2.1	Remember	CO1	Physically documenting using Various mediums and tools	Research/ Fieldwork/ Workshop/ Studio	30
	2.2	Understand	CO2	Creating compiled presentation of documented data using drawings and other communication techniques.		
	2.3	Apply	CO3	Creating presentation explaining analytical diagrams of documented data		
	2.4	Apply	CO4	Learning advance digital tools to facilitate design process		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	1.2					
	1.3					
	1.4					
	1.5					
	1.6					
2. Workshop/ Fieldwork	2.1	Seminar/ Jury/ Assignment review	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	2.2					
	2.3					
	2.4					

**References**

1. Atelier Bow-Wow, and Yoshiharu Tsukamoto. 2014. Graphic Anatomy. Tokyo: TOTO Publishing
2. Atelier Bow-Wow, Yoshiharu Tsukamoto, and Momoyo Kaijima. 2014. Graphic Anatomy 2. Tokyo: TOTO Publishing
3. Fletcher, Alan. 2013. The Art of Looking Sideways. London: Phaidon.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**SEMESTER 3 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR 31	S3 Vertical Studio	12	12	1200	600	600	300	300	-	-
2	20BAR 32	History and Construction	3	3	300	150	150	75	75	-	-
3	20BAR 33	Environment and Building Structures	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

**Semester 3**  
**S3 Vertical Studio**

Course Code: 20BAR31

Credits: 12

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The studio is run vertically between the third and the fifth semester and focuses on the role of institutions in society. Third-semester students are expected to design multi-functional, multi-user spaces, in the public and private domain. The focus of the studio will be on the making of place and form. The course will introduce students to simple area calculations, and basic building codes and bylaws that regulate, zoning, the position of buildings on site, buildable volume, and minimum standards for safety and accessibility. A field trip is recommended, where possible, to understand the context of the project site. Students will be encouraged to work with computer-aided design and modelling. The course also features two workshops, one on creative writing, and the next on human rights.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	4	6	12							
Per semester	30	60	90	180	600	600	1200	300	300	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
Apply	CO1	The role of institutions in society, and the effect that social and economic factors exert on the built form.
Understand	CO2	Building codes and bylaws related to public and semi-public buildings.
Communicate	CO3	Use appropriate media including the written word and architectural representation techniques to communicate design ideas.
Apply	CO4	Design spaces that cater to multiple functions and user groups utilizing an established architecture language, and structural systems that relate to multi-level and multi-use structures.
Create	CO5	Develop building forms that respond to the climate and the context, and communicate a certain meaning to the public.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	—	2	2	1	1	1	—	Unrelated		
CO2	2	—	1	1	1	—	1	1	Indirectly Related		
CO3	—	2	—	1	—	—	1	2	Directly Related		
CO4	1	1	2	2	2	—	1				
CO5	—	—	—	2	—	-	2				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	The role of institutions in society, and the effect that social and economic factors exert on the built form.	Lecture/ Self Directed Study	30
	1.2	Analyse	CO5	Form-finding and the making of place, by utilising an established architecture language.		
2. Studio	2.1	Apply	CO4	The design of multi-functional, multi-user spaces, in the public and private domain.	Research/ Fieldwork/ Studio	60
	2.2	Apply	CO5	Form-finding and the making of place, by utilising an established architecture language.		
	2.3	Analyse	CO5	Study, documentation and analysis of the project site to understand its context.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.4	Apply	CO2	An introduction to simple area calculations, and basic building codes and byelaws that regulate, zoning, the position of buildings on site, buildable volume, and minimum standards for safety and accessibility.		
<b>3. Workshop/ Fieldwork</b>	3.1	Understand	CO5	Study, documentation and analysis of the project site to understand its context.	Fieldwork/ Online/ Self Directed Study/ Workshop	<b>90</b>
	3.2	Communicate	CO3	Students are encouraged to work with computer aided design and modelling software to present their design schemes.		
	3.3	Communicate	CO3	Creative Expression and Writing Workshop: An introduction to writing and other modes to express ideas relating to curricular and extracurricular interests.		
	3.4	Understand	CO4	Human Rights Workshop: An introduction to human rights and advocacy organisations at both local and global levels.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
<b>1. Lecture</b>	1.1	Seminar/ Assignment review	<b>30</b>	<b>100</b>	Review (Digital Portfolio/ Report)	<b>100</b>
	1.2					
<b>2. Studio</b>	2.1	Assignment review/ Jury/ Time problem	<b>60</b>	<b>300</b>	Review (Portfolio/ Digital Portfolio/ Report)	<b>300</b>
	2.2					
	2.3					
	2.4					
<b>3. Workshop/ Fieldwork</b>	3.1	Jury/ Assignment review/ Written assignment review*	<b>90</b>	<b>200</b>	Review (Portfolio/ Digital Portfolio/ Report)	<b>200</b>
	3.2					
	3.3					
	3.4					

\*Mandatory Written Essay component for at least one Unit.

**References**

- Ching, Francis D. K. 2014. Building Construction Illustrated. John Wiley & Sons.
- Kostof, Spiro, and Greg Castillo. 1999. The City Assembled: The Elements of Urban Form Through History. Thames and Hudson.
- Lynch, Kevin. 1960. The Image of the City. MIT Press.
- Roth, Leland M. 2018. Understanding Architecture: Its Elements, History, and Meaning. Routledge.
- Unwin, Simon. 2013. Analysing Architecture. Routledge.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 3**  
**History and Construction**

**Course Code: 20BAR32**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course explores through the lens of history, the role of materials, construction techniques, and technology in shaping the physical structures and spatial qualities of the built environment.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	0	1	3							
Per semester	30	0	15	45	150	150	300	75	75	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Apply</b>	<b>CO1</b>	Students will develop a fundamental understanding of materiality, structural systems, and the evolution of building typologies and spatial configurations.
<b>Analyze</b>	<b>CO2</b>	Introduce the history of architecture and develop an understanding of various typologies that have evolved across the world. Further, deduce the relationship of typologies with the space function and structure. Additionally, the study will help analyse and understand the dependent variables that play a pivotal role in shaping the built form.
<b>Analyze</b>	<b>CO3</b>	Examine how built forms could be novel Ideas/Creations by Patronages/ Political Regimes/ Individuals

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	—	2	2	1	-	1	—	Unrelated
CO2	-	—	1	1	2	-	-	1	Indirectly Related
CO3	-	—	2	2	2	-	-	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	The relationship of a culture's view of itself to history is evident in understanding that the structures we design and the materials we choose reflect our ideology of who we are as a people.	Lecture/ Self-directed study	30
	1.2	Understand	CO2	To understand the significance of "Structure & Materiality" as a cultural expression.		
	1.3	Remember	CO3	The relationship of a culture's view of itself to history is evident in understanding that the structures we design and the materials we choose reflect our ideology of who we are as people.		
2. Workshop	2.1	Analyse	CO1	Students will learn to identify buildings or incidents of pathbreaking construction techniques developed in the regard of structure and technology being one of the determinants in shaping the history of a place or community.	Fieldwork/ Workshop	15

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.2	Communicate	CO2	Making sectional models of buildings to further understand the technological and aesthetic conditions that produced a range of architectural forms and styles is a suggested way of learning history in a hands-on manner.		
	2.3	Evaluate	CO3	This course explores through the lens of history, the role of materials, construction techniques, and technology in shaping the physical structures and spatial qualities of the built environment with help of local and international examples.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Assignment review/ Written Assignment Review*	30	60	Review (Portfolio/ Digital Portfolio/ Report)	60
	1.2					
	1.3					
2. Workshop	2.1	Jury/ Assignment review/ Written Assignment Review*	15	90	Review (Portfolio/ Digital Portfolio/ Report)	90
	2.2					
	2.3					

\*Mandatory Written Essay component for at least one Unit.

**References**

- Roth, Leland M., and Amanda C. R. Clark. 2018. Understanding Architecture: Its Elements, History, and Meaning. Routledge.
- Kostof, Spiro. 2010. A History of Architecture: Settings and Rituals. New York: Oxford University Press.
- Ching, Frank, Mark Jarzombek, and Vikramaditya Prakash. 2017. A Global History of Architecture. Hoboken, NJ: John Wiley & Sons.
- Mansbridge, John. 1968. Graphic History of Architecture. New York: Viking Press.
- De Landa, Manuel. 2019. A Thousand Years of Nonlinear History. New York: Zone Books.

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**Semester 3**  
**Environment and Building Structures**

**Course Code: 20BAR33**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course provides knowledge on the importance of environmental conservation, application of different materials and techniques used in construction. It also discusses the various analysis types and behaviour of structural systems. This course also demonstrates an understanding of basic concepts, principles, and terminology related to water and waste management, their architectural considerations, to apply them in architectural design independently or while working with consultants.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	2	2	6	300	300	600	100	100	100	3 Hours
Per semester	30	30	30	90							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	To recognize the importance of environmental conservation by identifying natural systems and designing to conserve or enhance existing natural systems.
<b>Apply</b>	<b>CO2</b>	To develop knowledge on the various types of cement, admixtures, the effective application of cement products in construction, and to identify the applications of different polymeric materials, adhesives, and sealants used in construction.
<b>Apply</b>	<b>CO3</b>	To gain knowledge on the construction of various building elements, and to discuss the critical role of materials and construction techniques used to structurally stabilize buildings, with an emphasis on their detailed specifications.
<b>Analyze</b>	<b>CO4</b>	To develop an understanding of the various concepts of structural analysis, to determine the behavior of structural systems, and to define the concepts of designing masonry and RCC structures using IS codes.
<b>Evaluate</b>	<b>CO5</b>	To recognize the various water supply and waste treatment systems and to evaluate the best method suited for a project.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	2	1	1	1	2	-	1	—	Unrelated		
CO2	1	—	2	2	2	—	1	1	Indirectly Related		
CO3	1	1	2	2	1	1	2	2	Directly Related		
CO4	—	—	1	1	2	1	1				
CO5	1	—	1	1	—	2	—				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Environmental</b>	1.1	Understand	CO1	Introduction to environmental conservation, understand its importance in planning and design by analysing various case studies.	Lecture/ Research	<b>15</b>
	1.2	Understand	CO1	Become familiar with the Methods for sustainable site planning, analysis, landscaping and site management, on a small scale with respect to Geology, Soils, Topography, Hydrology, Vegetation and Site Ecology.		
	1.3	Apply	CO1	Identify the natural systems of a site (from design studio) and apply strategies to conserve or enhance the systems.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Materials	2.1	Apply	CO2	Properties, manufacturing processes, types and applications of cement in building construction.	Research/ Self Directed Study/ Workshop	15
	2.2	Apply	CO2	Develop the knowledge on the properties and application of various polymeric materials, adhesives and sealants.		
3. Construction	3.1	Analyse	CO 3	Explain the nature and characteristics of load bearing wall construction, its advantages and limitations. Detailing of masonry roof constructions with detailed understanding of Jack Arch, Madras Terrace roofs.	Field work/ Workshop/ Studio	22.5
	3.2	Apply	CO 3	Identification and detailing of various spanning elements like Vaults and Domes		
	3.3	Understand	CO 3	Impart knowledge on Post- Beam construction and its details		
	3.4	Understand	CO 3	Timber staircases - detailing of timber staircases		
	3.5	Understand	CO 3	Gain familiarity with the different types of Industrial doors and windows making detail drawings of steel and aluminium - sliding, revolving, collapsible, rolling shutter.		
4. Structures	4.1	Apply	CO 4	Structural configuration and Conceptualization: Frame systems, Orientation of structural elements.	Lecture/ Workshop/ Studio	22.5
	4.2	Understand	CO 4	Behaviour of structural systems: Statically determinate & Indeterminate structures		
	4.3	Remember	CO 4	Methods for structural analysis, Design Philosophies: Limit State & Working Stress Methods, Loads & Load combinations		
	4.4	Understand	CO 4	Stress - Strain relationship of steel & concrete, generalised concept & design methodology of masonry structures.		
	4.5	Understand	CO 4	Reinforcement detailing for RC structures		
5. Services	5.1	Apply	CO5	Interpret different factors affecting quantity and quality of water such as demand & consumption, drinking water standards, physical and chemical characteristics of water.	Lecture/ Field work/ Self Directed Study/ Research	15
	5.2	Apply	CO5	Treatment & transmission of water: Processes involved – sedimentation, coagulation, filtration & disinfection, sedimentation tanks – Unit sand filters, rapid sand filters Distribution system – gravitational, pumping and combined, intermittent and continuous system, Layout of distribution networks.		
	5.3	Analyse	CO5	Wastewater: Wastewater characteristics – Types of oxygen demand Waste water treatment: Preliminary treatment of wastewater – screens, grit chamber, detritus tank, sedimentation tank		
	5.4	Analyse	CO5	Biological & Anaerobic treatment: Activated sludge process, Trickling filter, Oxidation Pond, chemical treatment, Anaerobic digesters, Septic tank and soak pit – Design. Wastewater disposal: Disposal into land, water bodies, Stream, ocean - disposal by irrigation.		
	5.5	Understand	CO5	Solid waste management: Refuse collection, disposal, Incinerator, Composting, Vermi-composting, Sanitary Land filling, Bio gas system and Modern renewable energy system		
	5.6	Understand	CO5	Plumbing layout in residential, high raised building – documentation		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Written test/ Assignment Review	15	50*	Written Exam	50
	1.2					
	1.3					

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
2. Materials	2.1	Seminar/ Jury	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
3. Construction	3.1	Seminar/ Jury	22.5	75	Review (Portfolio/ Digital Portfolio)	75
	3.2					
	3.3					
	3.4					
4. Structures	4.1	Jury/ Assignment Review/ Written Assignment Review	22.5	75	Review (Portfolio/ Digital Portfolio/ Report)	75
	4.2					
	4.3					
	4.4					
5. Services	5.1	Written test/ Seminar/ Jury/ Assignment Review/ Written Assignment Review	15	50*	Written Exam	50
	5.2					
	5.3					
	5.4					
	5.5					
	5.6					

\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50% weightage of the total CIE for that module.

### References

#### Environmental

1. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A., Szokolay, S. V., 1973. Manual of Tropical Housing and Building Part 1. Climatic Design, Orient Longman Pvt. Ltd.
2. Szokolay, S. V. 2008. Introduction to architectural science: the basis of sustainable design. SUN, WIND and LIGHT by G.Z. Brown.
3. Duggall, K. N. 2008. Elements of environmental engineering. New Delhi: S. Chand & Co.
4. Garg, S. K., 2009. Environmental Engineering, Vol. II, Khanna Publications.

#### Materials

5. Rangwala, S.C., 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
6. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

#### Construction

7. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead.
8. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.
9. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).

#### Structures

10. Raju N. Krishna, 2007 Reinforced Concrete Design: Principles and Practice. India: New Age International (P) Limited.
11. Bhavikatti, SS. Strength of Materials (For Polytechnic Students) (Latest edition). N.p.: Vikas Publishing House
12. Dr. Karve S R & Dr. Shah V L, Illustrated design of Reinforced concrete building. Latest Edition

#### Services

13. Steel, Ernest William., McGhee, Terence J., 1991. Water Supply and Sewerage. United Kingdom: McGraw-Hill.
14. Fair, Geyer and Okun, 2010. Water and Wastewater Engineering, John Wiley and sons, Inc.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**SEMESTER 4 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR41	Housing Studio	12	12	1200	600	600	300	300	-	-
2	20BAR42	History and Urbanism 1	3	3	300	150	150	75	75	-	-
3	20BAR43	Building Systems & Electrical Services	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

**Semester 4**  
**Housing Studio**

**Course Code: 20BAR41**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The studio focuses on understanding the role of housing within society and exploring the connections with its surroundings, within an existing urban fabric. Students will evolve housing types for a given program while addressing urban concerns derived from the context. It will introduce students to issues related to the design of the human habitat, its components, and spatial standards. Students will be introduced to the fundamental techniques and application of computer-aided design in the architectural profession. It also facilitates students to communicate their ideas through writing skills.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	4	6	12	600	600	1200	300	300	-	-
Per semester	30	60	90	180							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	Develop the understanding of community living and further identify the basis of establishing cultural context.
<b>Understand</b>	<b>CO2</b>	Understand various housing types and manners in which they give rise to unique urban issues and recognize socio-cultural factors that shape the identity of the community
<b>Apply</b>	<b>CO3</b>	Build the spaces from the concept and theories of placemaking, vertical stacking, public/ private spaces, open space, and shared amenities. Further demonstrate the understanding of concepts through drawings, write-up, and or models.
<b>Analyse</b>	<b>CO4</b>	Use of different representation techniques and tools to communicate design ideas and the process
<b>Create</b>	<b>CO5</b>	Develop a housing fabric through a structured method and communicate the idea of streetscapes, range of private and public domains, and organic vs. planned configurations

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	—	2	1	2	—	—	—	Unrelated
CO2	2	1	-	-	-	1	—	1	Indirectly Related
CO3	1	2	2	2	—	1	1	2	Directly Related
CO4	1	1	-	—	2	—	2		
CO5	-	-	2	2	1	-	2		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	The role of housing within society and issues related to design of the human habitat, its components and space standard, in both urban and rural contexts.	Class exercise/ Self- directed study/ Lecture	30
	1.2	Understand	CO1, CO2	Housing types and requirements for people from different socio-economic backgrounds in the Indian context		
	1.3	Remember	CO3	Introducing the concept of a unit, cluster and community.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Studio	2.1	Analyse	CO2, CO3, CO5	Evolving a typology of housing type from a given set of programs while catering to certain defined urban concerns.	Research/ Workshop/ Studio	60
	2.2	Understand	CO3	Concepts and theories of place making by developing design elements and responses for the particular user group, giving background research and defining a way forward for designing		
	2.3	Apply	CO3, CO5	Demonstrate the act of space making with the principles of form and space		
	2.4	Apply	CO3, CO5	Conceptualization of a single unit and its multiplication, ordering, patterns and variations.		
	2.5	Apply	CO3, CO5	Exploring vertical structure with innovative ways of stacking		
	2.6	Apply	CO3, CO5	Achieve material making by exploring design-detailing with appropriate materials and structural systems with response to climate as conceptually envisaged		
3. Workshop/ Fieldwork	3.1	Understand	CO2	The field trip component of the studio will have site visits during which students will study the site and the context in its macro (larger domains of society, culture, systems etc.) aspect as well as micro (selected site) aspect & measure-draw identified typologies	Fieldwork/ Workshop	90
	3.3	Apply	CO4	Convert architectural design project 2D drawings into 3D model using relevant software and render the same using an appropriate 3D visualisation software.		
	3.4	Communicate	CO4	Creative Expression and Writing Workshop: A workshop to develop communication skills through writing and other modes.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Assignment review	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	1.2					
	1.3					
2. Studio	2.1	Jury/ Time problem	60	350	Review (Portfolio/ Digital Portfolio/ Report)	350
	2.2					
	2.3					
	2.4					
	2.5					
	2.6					
3. Workshop/ Fieldwork	3.1	Jury/ Written assignment review*	90	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	3.3					
	3.4					

\*Mandatory Written Essay component for at least one Unit.

**References**

- Levitt, David, and Jo McCafferty. 2019. The housing design handbook: a guide to good practice. London: Routledge.
- Firley, Eric., Stahl, Caroline. 2009. The Urban Housing Handbook. United Kingdom: Wiley.
- Vroomen, Laura., Zondag, John., Sedighi, Mohamad Ali., Bouvier, Pierre., Zweeden, Alexander van., Mooij, Harald., Jürgenhake, Birgit., Uytengaak, Rudy., Leupen, Bernard., Nottrot, Robert. 2011. Housing Design: A Manual. Netherlands: NAI Publishers.
- Correa, Charles. 1999. Housing & Urbanisation. India: Urban Design Research Institute.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 4**  
**History and Urbanism 1**

Course Code: 20BAR42

Credits: 3

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

As an analysis of architecture in and around the subcontinent, the course highlights the various aspects that define urban settlements – the built environment, architecture, and landscape are some of them. It examines the determining factors for either the origin of cities or their evolution, by studying the forces of architecture, politics, and the social structures at play. Central to this analysis would be understanding the various layers, events of historical significance, and the ongoing evolution of the city. Apart from examples of towns and cities in Southeast Asia, regional/local places will become an important tool for learning. The course can specifically look at scenarios across the Indian subcontinent and the diverse architectural impacts of colonial trade and conquest can be discussed - new architectural programs, new building types, the formation of cosmopolitan port towns, and shifts in domestic architecture. The reverse flow of ideas from the Indian subcontinent to other places within the networks and the emergence of a new global style of architecture can be concepts that are looked into.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
					Int.	Ext.	Marks	Duration of Exam			
Per week	2	0	1	3							
Per semester	30	0	15	45	150	150	300	75	75	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	CO1	Describe the concept of urbanism and how it is almost always interwoven with the built form. Further understand and express the major and minor processes leading to the formation, growth, and historical evolution of towns and cities.
<b>Apply</b>	CO2	Build connections between the various layers of a town or city. Further analyse and assess the layers on certain parameters namely - conquest, trade, social factors, economics, politics, so on and so forth application.
<b>Analyse</b>	CO3	Identify and critically analyse and charter the course of the history of towns and cities. They will learn to identify factors that qualify as markers on which the evolution of a place hinges. In doing so they will be equipped to apply this learning to understand and study contexts as the primary premise for architecture/built form.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	1	-	-	-	-	-	—	Unrelated
CO2	2	1	1	1	2	2	-	1	Indirectly Related
CO3	2	1	2	2	2	2	-	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Analyse	CO1	Identification of regional architecture and material.	Class exercise/ Field work/ Lecture	30
	1.2	Understand	CO1	Establish the connection between the influencing factors that shaping the settlement.		
	1.3	Apply	CO1	Students will be able to learn Techniques for Documentation of settlement.		
	1.4	Remember	CO3	Identification of layers of a historic Settlement and categorizing them into systems		
	1.5	Analyse	CO3	Students will be able to rediscover the city and its socio-cultural values.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Workshop/ Field work	2.1	Apply	CO2	On-site documentation of nearby towns and cities can be conducted to understand architectural history through evolution and that evolution is an ongoing process.	Self-Directed Study/ Fieldwork/ Research	15
	2.2	Evaluate	CO2	Study of archival of city and historical documents and extracting relevant information.		
	2.3	Analyse	CO3	Identification of local and regional architectural elements.		
	2.4	Create	CO3	Redefining Cities definition by reading all the layers and systems together which are generated during onsite mapping.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment review/ Written assignment review*	30	30	Review (Portfolio/ Digital Portfolio/ Report)	30
	1.2					
	1.3					
	1.4					
	1.5					
2. Workshop/ Fieldwork	2.1	Seminar/ Jury/ Assignment review	15	120	Review (Portfolio/ Digital Portfolio/ Report)	120
	2.2					
	2.3					
	2.4					

\*Mandatory Written Essay component for at least one Unit.

**References**

1. Thakur, Nalini. 'Indian Cultural Landscapes: Religious Pluralism, Tolerance and Ground Reality'. Journal of SPA: New Dimensions in Research of Environments for Living "The Sacred", SPANDREL, no. 3, Monsoon (2011). <https://architexturez.net/doc/az-cf-21175>
2. Thakur, Nalini. 'The Architectural Knowledge Systems Approach'. New Delhi: Architexturez Imprints, 2002. <https://architexturez.net/doc/az-cf-21179>
3. Kostof, Spiro. 1999. The City Shaped: Urban Patterns and Meanings Through History. Thames & Hudson.
4. Kostof, Spiro. 2010. A History of Architecture: Settings and Rituals. New York: Oxford University Press.
5. Kostof, Spiro, and Greg Castillo. 2014. The City Assembled: The Elements of Urban Form Through History. New York, NY: Thames & Hudson.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 4**  
**Building Systems and Electrical Services**

**Course Code: 20BAR43**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course intends to advance from natural to composite materials with the primary focus on concrete as a building material and explorations of structural systems about it. The students will also start to explore framed structural systems with design methodology concepts in the advancement of the previously studied load-bearing systems. This course also focuses on the passive design strategies to regulate the thermal conditions at the micro and macro levels. The impact of various environmental issues and how the building industry can contribute towards trimming these issues, will be conveyed through this course. The course also introduces students to electrical services and illumination and to sensitize them to their integration into Architectural Design.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written Exam		
								Int.	Ext.	Marks	Duration of Exam	
Per week	2	2	2	6								
Per semester	30	30	30	90	300	300	600	100	100	100	3 Hours	

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Create</b>	CO1	To identify and describe passive design strategies used to create thermal comfort to enhance designs in the Housing Studio.
<b>Apply</b>	CO2	To comprehend the importance and varied applications of concrete as a composite building material in the construction industry and explore the different types of finishes.
<b>Create</b>	CO3	To comprehend the constructional aspects of concrete and steel in framed structural systems by describing the making, finishing, and detailing of each structural component involved.
<b>Understand</b>	CO4	To comprehend various structural design methods, and the Importance of the limit state method in designing RCC beams, columns, and slabs under various conditions. To describe methods of pre-stressing and stress loss involved in the design methods of PSC elements.
<b>Evaluate</b>	CO5	To describe electrical services, fire-fighting, illumination, and vertical transportation systems and integrate them into Architectural Design.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	2	1	2	2	2	2	2	—	Unrelated		
CO2	1	1	2	2	—	—	2	1	Indirectly Related		
CO3	—	1	2	2	—	—	2	2	Directly Related		
CO4	2	1	—	1	2	—	2				
CO5	1	—	1	1	1	2	2				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of Delivery	Hours
<b>I. Environmental</b>	1.1	Remember	CO 1	Recall passive design strategies and how thermal conditions inside the building can be modulated through design	Class Exercise/ Lecture/ Self- directed study	<b>15</b>
	1.2	Understand	CO 1	Understand urban heat island effect, its impact on the surrounding environment and human health and how building industry contributes to it. Comprehend on strategies used to reduce its impacts and create thermal comfort at community level.		
	1.3	Understand	CO 1	Introduce passive design strategies at a community level, block design, street layout, landscaping, etc for creating comfort conditions.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of Delivery	Hours
	1.4	Apply	CO 1	Application of the strategies learnt for developing design strategies for different climates.		
2. Materials	2.1	Understand	CO2	Develop knowledge on the various ingredients and composition in concrete.	Self-directed study/ Fieldwork/ Workshop/ Lecture	15
	2.2	Analyse	CO2	Develop firsthand knowledge on concrete production process and workability of concrete		
	2.3	Understand	CO2	Types of concrete and their suitable applications in various types of structures		
	2.4	Understand	CO2	Paints and Varnishes – Composition, properties and uses of ordinary and sustainable paints and coatings, varnishes and wood preservatives		
3. Construction	3.1	Remember	CO 3	Introduction to the concept of framed structures in RCC, understanding the types of formworks for concrete, scaffolding, shoring, duping etc. and introduction and detailing of trenches for excavation	Fieldwork/ Workshop	22.5
	3.2	Understand	CO 3	Introduction to foundations in RCC and construction details for various types of foundations		
	3.3	Understand	CO 3	Introduction to RCC slabs – one way and 2-way slabs		
	3.4	Remember	CO 3	Introduction to various types of R.C.C. staircases with respect to their uses		
	3.5	Understand	CO 3	Cantilevered construction in RCC such as canopies and projections.		
4. Structures	4.1	Remember	CO 4	RCC: Limit State Design Methodology of Beams, Slabs	Lecture/ Studio/ Workshop	22.5
	4.2	Remember	CO 4	Limit State Design Methodology of Columns, Footings		
	4.3	Understand	CO 4	PSC: Introduction, Principles, Materials		
	4.4	Understand	CO 4	System & Methods of pre-stressing, Losses of Pre-stress, Load Balancing concept		
	4.5	Analyse	CO 4	Analysis of sections: Concentric and Eccentric		
5. Services	5.1	Understand	CO5	Basics of Electrical systems: Introduction to electrical services, commonly used terminology, single and three phase supply, supply and distribution of electricity to buildings, electrical installations in buildings, safety measures and lightning protections	Research/ Field work/ Workshop/ Lecture	15
	5.2	Apply	CO5	Introduction to Indian electricity rules, electrical wiring design, electrical wiring system in domestic and commercial buildings, electrical load calculations, and exercise in load calculation.		
	5.3	Apply	CO5	Lighting Systems: Commonly used terms in illumination, laws of illumination, measurement of luminous flux and lux meter, lighting systems for building, light sources and Luminaries		
	5.4	Analyse	CO5	Lighting design and calculation, criteria and standards for different purpose/activity illumination, preparation of lighting scheme, and energy efficient lighting Electrical layouts (Documentation)		
	5.5	Evaluate	CO5	Firefighting systems: Fire hazards, fire suppression systems, fire safety, fire protection and fire exits		
	5.6	Apply	CO5	Vertical transportation systems: Elevators, Escalators and Travelators Types, installation requirements and design considerations		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Written test/ Assignment review	15	50*	Written Exam	50
	1.2					
	1.3					
	1.4					

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
2. Materials	2.1	Seminar/ Assignment review/ Written assignment review	15	50	Review (Portfolio/ Digital Portfolio/Report)	50
	2.2					
	2.3					
	2.4					
3. Construction	3.1	Jury/ Quiz	22.5	75	Review (Portfolio/ Digital Portfolio)	75
	3.2					
	3.3					
	3.4					
	3.5					
4. Structures	4.1	Assignment review/ Written assignment review	22.5	75	Review (Portfolio/ Digital Portfolio/Report)	75
	4.2					
	4.3					
	4.4					
	4.5					
5. Services	5.1	Written test/ Quiz/ Assignment review/ Written assignment review	15	50*	Written Exam	50
	5.2					
	5.3					
	5.4					
	5.5					
	5.6					

\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50% weightage of the total CIE for that module.

## References

### Environmental

1. Koenigsberger, O. H., Ingersoll, T. G., Mayhew, A., Szokolay, S. V., 1973. Manual of Tropical Housing and Building Part 1. Climatic Design, Orient Longman Pvt. Ltd.
2. Krishnan, A. (ed.), Baker, N., Yannas, S., Szokolay, S., 2001. Climate Responsive Architecture – A Design Handbook for Energy Efficient Buildings, Tata McGraw-Hill Publishing Company Limited, New Delhi.
3. Olgyay, V, 1963. Design with Climate
4. Yeang, Ken. 1995. Designing with nature: the ecological basis for architectural design. New York: McGraw-Hill.
5. Fuller Moore, 1992. Environmental control systems Heating, Cooling, Lighting. Publisher Mc. Graw Hill, Newyork.

### Materials

6. Rangwala, S.C. , 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
7. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

### Construction

8. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead.
9. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.
10. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).

### Structure

11. Raju N. Krishna, 2007 Reinforced Concrete Design: Principles and Practice. India: New Age International (P) Limited.
12. Bhavikatti, SS. Strength of Materials (For Polytechnic Students) (Latest edition). N.p.: Vikas Publishing House
13. Krishna, Raju N., 2016. Prestressed Concrete Bridges. India: CBS Publishers & Distributors.

### Servises

13. Dadras, Aly S. 1995. Electrical systems for architects. New York: McGraw-Hill.
14. Uppal, S. L., 1986. Electrical Wiring - Estimating & Costing. India: Khanna.; Latest Edition.
15. Schiler, Marc. 1992. Simplified Design of Building Lighting. John Wiley & Sons.
16. Menon G.B., Handbook on Building Fire Codes, IITK-GSDMA Project on Building Codes

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**SEMESTER 5 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR51	S5 Vertical Studio	12	12	1200	600	600	300	300	-	-
2	20BAR52	History and Urbanism 2	3	3	300	150	150	75	75	-	-
3	20BAR53	Building Detailing & Valuation	6	6	600	300	300	100	100	100	3 Hours
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

**Semester 5**  
**S5 Vertical Studio**

**Course Code: 20BAR51**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The studio is run vertically between the third and the fifth semester and focuses on the role of institutions in society. The focus of the studio will be on urban concerns, integration at the neighbourhood/ community level, application of systems and services, and the design of new building typologies. Students will also be able to integrate building codes and standards into the design process. A field trip is recommended, where possible, to understand the context of the project site. Students will be encouraged to work with advanced design and modelling software. The course also features two workshops, one on academic writing, and the next on gender equity.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
					Int.	Ext.	Marks	Duration of Exam			
Per week	2	4	6	12							
Per semester	30	60	90	180	600	600	1200	300	300	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	Understand and visualize the role played by institutional architecture and design in shaping the urban realm.
<b>Communicate</b>	<b>CO2</b>	Use appropriate media including the written word and architectural representation techniques to communicate design ideas.
<b>Apply</b>	<b>CO3</b>	Understand the National building code, regional building codes, and Indian Standard Codes, and design according to the local building codes and bylaws.
<b>Analyse</b>	<b>CO4</b>	Application of systems and services in the design, focusing on sustainable and passive design strategies.
<b>Analyse</b>	<b>CO5</b>	Understand the site context using site study, deducting, documenting, and analysis techniques. Further, integrating the design proposal to blend within the fabric of social and physical site context.
<b>Create</b>	<b>CO6</b>	Evolving an architectural language and designing for new or hybrid building typologies.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:		
CO1	2	1	—	-	2	—	1	—	Unrelated	
CO2	—	2	—	-	2	—	2	1	Indirectly Related	
CO3	—	—	2	2	1	—	2	2	Directly Related	
CO4	—	—	1	1	2	1	2			
CO5	1	2	—	-	2	2	2			
CO6	—	2	2	2	2	-	2			

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Lecture</b>	1.1	Understand	CO1 CO5	Understanding urban concerns at the level of a district/ neighbourhood, and the role played by institutions in shaping the urban landscape.	Lecture/ Self- Directed Study	<b>30</b>
	1.2	Understand	CO3	Study of regional building codes with respect to building types, location, architectural controls, services, etc. It will cover both national and international examples, to gain understanding of both national as well as international standards.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Studio	2.1	Apply	CO1 CO5	Focusing on urban concerns, designing at a district/ neighbourhood level, and integrating the proposal within the local context.	Research/ Field work/ Workshop/ Lecture/ Studio	60
	2.2	Evaluate	CO5	Studying, documenting, and modeling an urban district/ neighbourhood, to understand the site and its context.		
	2.3	Apply	CO3	Understanding the National building code, regional building codes and Indian Standard Codes and integrating building codes and standards into the design process.		
	2.4	Apply	CO4	Integrating building systems and services into the design scheme, while focusing on ecological sustainability, and design for reduced use of energy, as well as passive systems and their management.		
	2.5	Create	CO6	Evolving an architectural language and designing for new or hybrid building typologies.		
3. Workshop/Fieldwork	3.1	Analyse	CO5	Studying, documenting, and modelling an urban district/ neighbourhood, to understand the site and its context.	Fieldwork/ Workshop	90
	3.2	Communicate	CO2	Students are encouraged to work with advanced design and modelling software to present their design schemes.		
	3.3	Communicate	CO2	Academic Writing Workshop: An introduction to writing about issues related to architecture and allied disciplines.		
	3.4	Understand	CO1 CO5	Gender Equity Workshop: Definitions and policies related to gender, and the role of gender in architecture and urban design.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lectur	1.1	Seminar/ Assignment Review	30	100	Review (Portfolio/ Digital Portfolio/Report)	100
	1.2					
2. Studio	2.1	Jury/ Assignment Review/ Time Problem	60	300	Review (Portfolio/ Digital Portfolio)	300
	2.2					
	2.3					
	2.4					
	2.5					
3. Workshop/ Fieldwork	3.1	Jury/ Assignment Review/ Written Assignment Review*	90	200	Review (Portfolio/ Digital Portfolio/Report)	200
	3.2					
	3.3					
	3.4					

\*Mandatory Written Paper component for at least one Unit.

**References**

- Alexander, Christopher. 1979. The Timeless Way of Building. Oxford University Press.
- Jacobs, Jane. 2020. Death and life of Great American Cities. London: The Bodley Head.
- Kostof, Spiro, and Richard Tobias. 2012. The city shaped: urban patterns and meanings through history. New York: Bulfinch Press.
- Kostof, Spiro, and Greg Castillo. 2014. The city assembled: the elements of urban form through history. New York, NY: Thames & Hudson.
- Lynch, Kevin. 1960. The Image of the City. United Kingdom: MIT Press.
- Rossi, Aldo, Graham Foundation for Advanced Studies in the Fine Arts, and Institute for Architecture and Urban Studies. 1982. Architettura Della Città. MIT Press.
- National Building Code of India, 2005 (NBC 2005)
- Regional Building Codes
- Indian Standard Codes

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 5**  
**History and Urbanism 2**

**Course Code: 20BAR52**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The course is an in-depth study of the city across space and time, identifying factors that affect its growth, and the planned versus organic nature of cities. It is also an introduction to contemporary urban theory and how a city is viewed across various disciplines such as anthropology, sociology, psychology, and economics, to name a few. The course focuses on unearthing the different layers in the history of evolution of global cities and progresses to build the narrative to understand the same in the present time.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	0	1	3	150	150	300	75	75	-	-
Per semester	30	0	15	45							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	To trace out through history the changing paradigms of the evolution of global cities by embracing the myriads of influencing aspects from varying dimensions of trade routes, geopolitical opportunity, Europe's commercial wave, military capability, industrialization, globalization, Influences of the British empire, IT powered wave, new trade arrangements, etc.
<b>Apply</b>	<b>CO2</b>	Dramatize and illustrate the dialogue of cities with the proponents of change by unearthing the layer of phases that cities traverse over time – origin, growth, and decline/ sustenance.
<b>Analyse</b>	<b>CO3</b>	To decipher the vocabulary of comprehending the global cities and interpreting the concept to present times
<b>Apply</b>	<b>CO4</b>	To apply the knowledge of what forms and informs cities and shape them into evolving entities with critically selecting such an example and developing a methodology of the study of all parameters previously dealt in detail.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	2	—	—	—	2	—	1	—	Unrelated		
CO2	1	1	2	2	1	1	1	1	Indirectly Related		
CO3	2	2	2	2	2	—	—	2	Directly Related		
CO4	1	1	2	2	1	1	—				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	The evolution of global cities by studying the influencing aspects in time	Class exercise/ Lecture/ Studio	30
	1.2	Analyse	CO2	Study how the various layers of town/city formation till date (origin, growth, sustenance/ decline) has been intersected by time-specific functions, aesthetic norms, political and cultural regimes. etc)		
	1.3	Evaluate	CO3	Accommodating the dimensions of time and space to apply to a list of cities and towns of study which can be comprehensive - geographically and chronologically		

2. Workshop	2.1	Create	CO4	Critically selecting an example and developing a methodology of study of all parameters that forms and informs the cities and shape them into evolving entities and detailing the same for the example chosen.	Research	15
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**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Jury/ Assignment review/ Time problem	30	75	Review (Portfolio/ Digital Portfolio)	75
	1.2					
	1.3					
2. Workshop	2.1	Jury/ Witten Assignment Review*	15	75	Review (Portfolio/ Digital Portfolio)	75

\*Mandatory Written Paper component for at least one Unit.

**References**

1. Kostof, Spiro. 1999. The City Shaped: Urban Patterns and Meanings Through History. Thames & Hudson.
2. Kostof, Spiro, and Greg Castillo. 2014. The City Assembled: The Elements of Urban Form Through History. New York, NY: Thames & Hudson.
3. Mumford, Lewis. 2009. The City in History: Its Origins, Its Transformations, and Its Prospects. San Diego: Harcourt.
4. Mcadams, Michael A., Jesus Trevino Cantu, and Ivani Vassoler-Froelich. 2012. The Geography, Politics, and Architecture of Cities: Studies in the Creation and Complexification of Culture. Lewiston, N.Y.: Edwin Mellen Press.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 5**  
**Building Detailing and Valuation**

**Course Code: 20BAR53**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course will emphasize on demonstration of the learning of construction techniques and materiality aspects done during previous semesters and aims to build upon the skills of the preparation of construction drawings and professional practice-oriented requisites. The students will learn to demonstrate their architectural and structural design ideas into generating drawings that are ready for construction. The process also would involve developing a sense of project milestones catering to the site requirements, valuation of the project, and in the process, developing an intuitive sense of individuality in developing such working drawings. This course introduces the students to the energy-related laws and codes relevant to the Indian building industry and their implications of on-site activities and building design.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written Exam	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	2	2	6							
Per semester	30	30	30	90	300	300	600	100	100	100	3 Hours

**Course Outcomes**

Domain/ Level	Outcomes	
Apply	CO1	To summarize various environmental laws and energy codes relevant to the Indian building industry and recognize its implications on building sites and environment
Apply	CO2	To interpret and communicate information through detailed drawings to the site, incorporating the details of the construction process. To illustrate standard practices, approvals, permits, regulatory processes, and specifications to produce construction documents.
Analyse	CO3	To illustrate connections between structural steel members, and the design concepts of tensile and compressive members, and special structural forms.
Apply	CO4	To demonstrate the various processes of estimation, costing, valuation and tendering.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	—	2	2	—	-	2	—	Unrelated		
CO2	1	2	2	2	1	1	2	1	Indirectly Related		
CO3	—	1	1	1	2	1	1	2	Directly Related		
CO4	1	—	2	2	—	2	—				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Environmental	1.1	Understand	CO1	Introduction to a short history of the development of environmental laws and policies. Understand the international, national and local laws and codes relevant to the Indian building industry.	Self-directed study/ Studio	10
	1.2	Understand	CO1	Introduction to energy codes for India. Understand the implications of energy related codes in the Indian scenario.		
2. Working Drawing	2.1	Communicate	CO 3	Introduction to Working drawing - drafting tools, specifications, geometry and scales, useful references, lettering, symbols and conventions, dimensions, notes and titles	Self-directed study/ Studio/ Fieldwork	35

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.2	Remember	CO 3	Introduction to building codes and standards for working drawings and related construction specifications		
	2.3	Analyse	CO 3	Understanding the Working drawing process: from site plan, site utility plan, landscaping plan, floor plan, foundation plan, structural plan, framing plan, roof plan, exterior elevations, building sections, cross referencing, wall sections, interior elevations etc. Schedules: doors, windows, finishes etc. Detailing: Doors, Windows, Stairs, Environmental index.		
3. Structures	3.1	Understand	CO 3	Steel connections: Bolted connections, types of bolts. Welded connections: types of welds	Research/ Workshop/ Lecture	22.5
	3.2	Understand	CO 3	Types of steel sections: Introduction of IS standards; IS: 800:2007, Steel table code		
	3.3	Apply	CO 3	Design Methodologies of Tension & Compression members (Generalized concepts only theory)		
	3.4	Understand	CO 3	Concepts of shell, folded plates, domes, flat slabs, Grid slabs, tall buildings		
	3.5	Understand	CO 3	Tensile & Pneumatic structures		
4. Services	4.1	Understand	CO4	Quantity estimation: Types & Purpose, Approximate estimate of buildings, Bill of Quantity, Unit of measurement for various items of work Preparation of specification for materials of construction and items of work	Workshop/ Lecture	22.5
	4.2	Analyse	CO4	Introduction to approximate estimate methods - plinth area method, cubic rate method, unit rate method and bay method. Abstract of an estimate, Deriving detailed quantity Estimate for various items of work of a building		
	4.3	Understand	CO4	Costing: Components of an estimate: material cost, labour cost, equipment cost, work charge establishments, contractor's profit, Principles of measurement & billing, Contingencies		
	4.4	Analyse	CO4	Valuation: Purpose, methodologies, approaches and techniques, valuation process, valuation analysis, associated laws and issues		
	4.5	Understand	CO4	Tendering: Types/Classification of tenders, tendering process, main parts of tender documents, tender evaluation procedures and tender award		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Written test/ Written assignment review	10	25*	Written Exam	25
	1.2					
2. Working Drawing	2.1	Jury/ Written assignment review	35	125	Review (Portfolio/ Digital Portfolio/ Report)	125
	2.2					
	2.3					
3. Structures	3.1	Seminar/ Jury	22.5	75	Review (Portfolio/ Digital Portfolio)	75
	3.2					
	3.3					
	3.4					

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
	3.5					
4. Services	4.1	Written test/ Written assignment review	22.5	75*	Written Exam	75
	4.2					
	4.3					
	4.4					
	4.5					

\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50% weightage of the total CIE for that module.

### References

#### Environmental

1. Indian Green Building Council. 2008. LEED India CS: for core and shell, reference guide latest version.
2. Fuller Moore, 1992. Environmental control systems Heating, Cooling, Lighting. Publisher Mc. Graw Hill, Newyork.

#### Material

3. Rangwala, S.C. , 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
4. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.
5. National Building Code of India, 2005 (NBC 2005)

#### Working Drawing

6. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead..
7. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).
8. Wakita, Osamu A. 2017. Professional Practice of Architectural Working Drawings. Wiley & Sons Canada, Limited, John.

#### Structure

9. Subramanian N., Design of Steel Structures, as per IS 800:2007, Oxford University Press. Latest edition.
10. Duggal S K., 2010. Limit state design of steel structures, Tata Mc Grawhill, New Delhi

#### Service

11. National Building Code of India, 2005 (NBC 2005)
12. Dutta, B.N. , 2021. Estimating and Costing in Civil Engineering: Theory and Practice. India: CBS Publishers & Distributors.
13. Upadhyay, A. K., 2011. Civil Estimating and Costing: Including Quantity Surveying, Tendering and Evaluation. India: Kataria & Sons; Reprint Latest edition.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 5  
Co-Op Prep**

<b>Type of Course:</b>	
<b>Prerequisites:</b>	None

**Course Description**

This course aims to prepare the students for the Co-operative Learning assignment in semester 6, by preparing them for practical work in a professional environment, as well as guiding them in choosing an appropriate office or organisation for their Semester 6 Co-operative Learning assignment.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written		
								Int.	Ext.	Marks	Duration of Exam	
Per week	0	0	1	1								
Per semester	0	0	15	15	-	-	-	-	-	-	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Apply</b>	CO1	Build and develop office etiquettes, soft skills necessary while in a professional setting.
<b>Evaluate</b>	CO2	Compare different options and choose the field of interest as per their aptitude and skill.
<b>Create</b>	CO3	Implement the learning in the design process and generate workable solutions.
<b>Create</b>	CO4	Develop and collect works done during the internship and present them succinctly using appropriate presentation techniques.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	2	2	2	1	—	—	—	Unrelated
CO2	2	1	1	1	1	2	—	1	Indirectly Related
CO3	2	1	-	-	2	2	2	2	Directly Related
CO4	1	1	-	-	—	—	2		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Workshop	1.1	Understand	CO1	<b>Soft Skills:</b> Writing emails in a professional forum, approaching someone on a professional front, Initiating conversations and dialogues etc. <b>Conduct and Presentation:</b> How to look presentable for an interview/ office, how to conduct oneself in an office	Lecture/ Self- Directed Study/ Research/ Workshop	15
	1.2	Communicate	CO2	<b>Explore fields of interest under</b> - Interior Architecture - Eco Architecture - Construction Technology		
	1.3	Apply	CO3	Research upon various Firms, Offices, NGO's, Architects and Artists and present to the class. Apply and secure Co-op Internship with the respective mentors by sending out portfolio.		
	1.4	Create	CO4	<b>Visual Representation:</b> Creating the portfolio- Colour schemes, Presentation techniques, Styles etc.		

**SEMESTER 6 (LEVEL 2)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR65	Cooperative Learning	—*	24	2400	1200	1200	600	600	-	-
<b>Total</b>			—	<b>24</b>							

\* As per Regulations

**Semester 6**  
**Co-operative Learning**

**Course Code: 20BAR65**
**Credits: 24**

<b>Type of Course:</b>	<b>Professional Ability Enhancement Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

To gain practical experience working in a chosen field of interest outside the school environment with a focused objective to include allied fields of architecture, and help shape powers of analysis and creativity in Level 3 of the program.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
					Int.	Ext.	Marks	Duration of Exam			
Per week	—	—	—	—*							
Per semester	—	—	—	—*	1200	1200	2400	600	600	—	—

\*As per Regulations

**Course Outcomes**

Domain/ Level	Outcomes	
Create	CO1	Summarize and formulate the knowledge and skillsets gained during the training.
Analyse	CO2	Discover individual self-skills concerning specific domain and further identify and develop the expertise needed to carry out the tasks in the office.
Create	CO3	Compile the undertakings in an area of specialization and further synthesize ideas about the synergy between academic teachings and practical learnings.
Analyse	CO4	Analyse and interpret learning in terms of the design process and generate workable design solutions in architecture.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	1	1	1	—	1	2	—	Unrelated
CO2	1	1	2	2	2	-	-	1	Indirectly Related
CO3	1	—	—	-	-	-	2	2	Directly Related
CO4	1	—	1	1	2	1	2		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Workshop	1.1	Create	CO1 CO2 CO3 CO4	Co-operative Learning is an experiential learning program that takes education beyond the classroom. Students in the sixth semester will have to undergo at least 16 working weeks of full-time work under the supervision of a professional from Architecture or allied fields, gaining practical experience and theoretical understanding in specialized, discipline related electives of their choice. Students are adequately supervised and evaluated to ensure that the work experience is balanced with academics, and academic goals are met.	Practical Training/ Self-Directed Study	-

**Scheme of Evaluation**

**SEMESTER 7 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR71	Urban Studio/Exchange Studio	12	12	1200	600	600	300	300	-	-
2	20BAR73	Building Systems and Practices	6	6	600	300	300	100	100	100	3 Hours
3	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*Two elective courses of 3 credits each are recommended

**Semester 7**  
**Urban Studio/Exchange Studio**

**Course Code: 20BAR71**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Housing Studio and Vertical Studio

**Course Description**

The studio is designed as a traveling studio that encourages students to understand and explore the creative dialectic and conflict, between urban design, policy-making, and sociology. To understand the changing conception of community, students study human settlements and understand the distinction between descriptive and normative theory by examining examples of various urban theories across time.

The studio, to demonstrate the understanding of a city, what shapes the city, and how cities are changing, focuses on documentation and strategy proposals. Students analyse the physical form of cities, from suburban areas to the central business districts, and the processes that shape them.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	4	6	12	600	600	1200	300	300	-	-
Per semester	30	60	90	180							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Remember</b>	CO1	Would be able to recognize, relate and analyse the morphology of different urban contexts.
<b>Create</b>	CO2	Identify, collect and deduce social fabric parameters from various layers of the city. Further, synthesize ideas about how an architectural design can work in harmony with different systems in place.
<b>Analyse</b>	CO3	Visualize and explain the site concerning various social, economical, and intra-personal dimensions. Build the ideas using various mapping methods. Further, propose design interventions.
<b>Evaluate</b>	CO4	Analyse the values implicit in each of their proposals, stressing the connections between ideas and design.
<b>Create</b>	CO5	Develop and discover the skills and ability to generate appropriate urban scale drawings and maps. Further, discuss and present the analysed data succinctly. Additionally elaborate on how the proposed design strategies work at the macro, and micro scales.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	2	1	-	—	2	—	—	—	Unrelated		
CO2	1	—	-	—	2	—	2	1	Indirectly Related		
CO3	1	1	1	1	2	-	2				
CO4	1	1	—	1	2	2	2				
CO5	1	1	1	1	2	2	2				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Remember	CO1	The Studio is an experience to learn about cities. It shall concentrate on the learnings of physical and social form of cities. Along with the basic understanding of the history and origin of cities and settlements, the studio will also concentrate on various theories of normative, descriptive and functional, which forms cities.	Class exercise/ Self- directed study/ Lecture	30
	1.2	Understand	CO2	The lecture component shall be divided into three sections. 1. The first examines the nature of city form theory through examples of traditional attempts to explain how cities origin and perform.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.3	Apply	CO3	2. The second section focuses on the modern city studies, its processes and then discusses in detail the various urban inventions that created it and formed the basis of the contemporary city.		
	1.4	Analyse	CO3	3. The third section attempts to read and discuss on the understanding of the first two sections, and based on analysis of the present city or the selected site, strategize for different theme-based scenarios.		
2. Studio	2.1	Remember	CO3	The studio is designed with the intent to give students exposure to urbanism in different cities that encourages students to understand and explore the creative dialectic and conflict, between urban design, policy-making, and sociology.	Self-directed study/ Field work/ Studio	60
	2.2	Understand	CO3	In order to understand the changing conception of 'community', students study human settlements, and understand the distinction between descriptive and normative theory by examining examples of various urban theories across time.		
	2.3	Apply	CO4	The studio, in order to demonstrate the understanding of a city, what shapes the city, and how cities changing, focuses on documentation and strategy proposals are. Also, to document, the stages shall be, 1. Differentiating with different urban scenarios and understand the deeper context with social and cultural context. 2. Organizing and documenting the complete site analysis in terms of various layers of the same. 3. Attributing the intervention accordingly with respect to certain act of documenting and mapping exercises.		
	2.4	Analyse	CO6	Students analyse the physical form of cities, from suburban areas to the central business districts, and the processes that shape them. However, the various ways of representation shall be as follows: 1. Generating maps with different layers as a part of the documentation and the entire exercise of urban intervention. 2. Planning strategies based on concerns raised in site, after analysis. 3. Producing maps and drawings showing the entire process of analysis, strategies and the design proposal, that will in turn help in the curating of an exhibition at the end of the semester.		
3. Workshop/ Fieldwork	3.1	Understand	CO5	The lab or the field work component of the studio will have the site visit in it, where, for a certain period of time, the students shall stay in site and complete the basic works of documenting the same.	Workshop/ Fieldwork	90
	3.2	Analyse	CO5	A research workshop, where the students take up various urban concerns and conduct primary and secondary research on the same.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment review/ Time Problem	30	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	1.2					
	1.3					
	1.4					
2. Studio	2.1	Jury/ Assignment review	60	300	Review (Portfolio/ Digital Portfolio/ Report)	300
	2.2					
	2.3					
	2.4					

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
3. Workshop/ Fieldwork	3.1	Seminar/ Jury/ Written Assignment Review*	90	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	3.2					

\*Mandatory Written Paper component for at least one Unit.

### References

- Lynch, Kevin. 1980. *The Image of the City*. Cambridge: MIT Press.
- Lynch, Kevin. 1981. *A theory of good city form*. Cambridge: The MIT Press.
- Mitchell, William John. 2010. *City of bits: space, place, and the infobahn*. Cambridge, Mass: MIT Press.
- Newman, Oscar. 1978. *Defensible Space*. New York: Collier Books.
- Newman, Peter, and Jeffrey R. Kenworthy. 1999. *Sustainability and cities: overcoming automobile dependence*. Washington, D.C.: Island Press.
- Rowe, Colin, Fred Koetter, and Kenneth Hylton. 2005. *Collage city*. Gollion [Suisse]: Infolio.
- Tschumi, Bernard. 1994. *Event cities: praxis*. Cambridge (Mass.): MIT Press.
- Venturi, Robert, Steven Izenour, and Denise Scott Brown. 2006. *Learning from Las Vegas: the forgotten symbolism of architectural form*. Cambridge, Mass: MIT Press.
- Jacobs, Jane. 2020. *Death and life of Great American Cities*. London: The Bodley Head.
- Larice, Michael, and Elizabeth Macdonald. 2013. *The urban design reader*. London: Routledge.
- LeGates, Richard T., and Frederic Stout. 2004. *The Routledge urban reader series*. London: Routledge.
- Wolfe, Tom. 2009. *From Bauhaus to our house*. New York: Picador.
- Short, John Rennie. 2020. *Urban theory: a critical assessment*. London: Macmillan Education.
- Lang, Jon T. 2017. *Urban design: a typology of procedures and products*.
- Ben-Joseph, Eran. 2005. *The code of the city: standards and the hidden language of place making*. Cambridge, Mass: MIT Press.
- Paumier, Cyril B. 2004. *Creating a vibrant city center: urban design and regeneration principles*. Washington, D.C.: Urban Land Institute.
- Walters, David. Brown, Linda. 2012. *Design First*. Netherlands: Taylor & Francis
- Cullen, Gordon. 2015. *The concise townscape*. Abingdon: Architectural Press.
- Watson, Georgia Butina, and Ian Bentley. 2007. *Identity by design*. Amsterdam: Elsevier.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 7**  
**Building Systems and Practices**

**Course Code: 20BAR73**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course introduces the concept of Metal building systems with a specific example of steel and its applicability in building construction. The students will be introduced to Structural steel and its uses as a building material. They will explore the possibilities of building typologies made possible with the use of structural steel. This course facilitates students to get acquainted with international and national green building rating systems that evaluate building performance. The course aims at exposing architecture students to the mechanical systems, their underlying principles, areas of air conditioning, and refrigeration system. This also familiarizes them with the various air conditioning systems, their applications studies the design issues for the selection of various systems and their installation.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	2	2	6							
Per semester	30	30	30	90	300	300	600	100	100	100	3 Hours

**Course Outcomes**

Domain/ Level	Outcomes	
Apply	CO1	To identify the basic tenets of green buildings and their benefits, and develop knowledge on green building rating systems.
Apply	CO2	To comprehend the usage of ferrous and nonferrous materials in building construction; with a primary focus on steel, and to develop knowledge on its significant usage in large-span structures.
Analyze	CO3	To illustrate material qualities, finishes, and methods of construction using steel, and to comprehend and analyse the use of steel in complex structural systems, its application in catering to large-span structures, and its integration with design studio
Analyze	CO4	Discuss the active and passive components of Heating Ventilation and Air Conditioning (HVAC), their underlying principles, and apply the knowledge in their design studio.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	—	2	2	—	2	1	—	Unrelated		
CO2	1	—	2	2	2	—	1	1	Indirectly Related		
CO3	1	—	2	2	2	1	2	2	Directly Related		
CO4	1	1	1	1	2	-	—				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Environmental	1.1	Understand	CO1	Get introduced to the tenets of green buildings and their benefits.	Class exercise/ Self- directed study/ Lecture	15
	1.2	Analyse	CO1	Get acquainted to the green building rating systems (e.g.- LEED, IGBC, GRIHA etc); that evaluate the building performance and its impact on the environment.		
	1.3	Analyse	CO1	Study the categories in the rating systems and the synergies between the categories, Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, Indoor Environmental Quality, Innovation and Social equity.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Materials	2.1	Remember	CO2	Properties and applications of ferrous metals like iron, steel and alloy steel	Self-directed study/ Field work/ Studio	15
	2.2	Remember	CO2	Properties and applications of non-ferrous metals such as Aluminium, Copper etc.		
	2.3	Understand	CO2	Forms of Steel available for Industrial construction & first to fourth generation steel roofing products.		
	2.4	Apply	CO2	Variety of Mild Steel sections – Sheets (plain & corrugated), Flats, Bars (round & square), Angles, R.S. Sections (I beam, Channels, Tees). Hollow Tubular sections available for application in building industry.		
	2.5	Analyse	CO2	Variety of glass products and their application in internal and external building works.		
3. Construction	3.1	Understand	CO3	Introduction to structural steel sections, construction details of grillage foundations and framed steel construction, understanding connections and bracing details in columns and beams, introduction to structural steel and composite sections, stanchions and girders	Field work/ Workshop/ Studio	30
	3.2	Understand	CO3	Introduction to Steel flooring systems (mezzanine flooring)		
	3.3	Communicate	CO3	Introduction to steel staircases understanding detailed drawings and construction details of steel staircases: straight flight, doglegged and spiral		
	3.4	Understand	CO3	Introduction to steel roofing systems, understanding detail drawings and construction details of structural steel trusses with roof coverings		
	3.5	Understand	CO3	Introduction to advanced steel structures and details of space frames, portal frames, castellated beams		
	3.6	Understand	CO3	Introduction to pre-fabrication; its advantages and disadvantages of on-site and off-site; relevance of prefabrication in Indian construction industry.		
4. Services	4.1	Understand	CO5	Recognise the scope and impact of mechanical system, impact of space planning, architectural design, high rise buildings, construction cost and global environment.	Field work/ Workshop/ Lecture	30
	4.2	Apply	CO5	Thermal Comfort: Standard requirements of ventilation for different conditions of living and works, conditions for comfort, control of quality, quantity, temperature and humidity of air. Indoor Air Quality, techniques and adaptations of different climatic conditions.		
	4.3	Remember	CO5	Fundamentals: Principles of heat transfer, thermodynamics, psychometrics, psychometric chart and its application. Refrigeration systems, refrigeration cycle, various components of refrigeration systems and cycle: compressor, chiller, condensers and understanding Principles of Air-conditioning.		
	4.4	Understand	CO5	Components and Equipments in Air conditioning systems, air conditioning equipments Cooling towers, cooling coil, refrigerants, boilers, ducts, electrical systems for HVAC, concepts of zoning, room air distribution-types of outlets. Direct expansion and chilled water systems, types of compressors, cooling tower, air handling unit, fan coil unit, pumps, hot water generator and chilled/ condenser water piping. Space requirements for A/c units, AHU's & a/c plant, ducting, testing and maintenance on ducts and pipes.		
	4.5	Apply	CO5	Spatial requirements, Cooling load calculation, Duct design, Blower design, maintenance, Concept of Air exchanges, Ducting. Location with due consideration for reduction of heat gain, economy and energy saving. Layout of supply and return air ducts. General considerations in air duct design layout.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	4.6	Communicat e	CO5	Sustainable design approaches: Materials and systems for insulation, energy efficient techniques regarding HVAC systems. HVAC drawings: Documentation and case studies of small scale and large-scale buildings, reading drawings, understanding notations, legends, symbols and sizes.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Environmental	1.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	1.2					
	1.3					
2. Materials	2.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
	2.3					
	2.4					
	2.5					
3. Construction	3.1	Seminar/ Jury	30	100	Review (Portfolio/ Digital Portfolio)	100
	3.2					
	3.3					
	3.4					
	3.5					
	3.6					
4. Services	4.1	Written test/ Assignment review/ Written assignment review	30	100*	Written Exam	100
	4.2					
	4.3					
	4.4					
	4.5					
	4.6					

\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50% weightage of the total CIE for that module.

**References**
**Environmental**

1. Lechner, Norbert., 2012 Plumbing, Electricity, Acoustics: Sustainable Design Methods for Architecture. United Kingdom: Wiley.
2. Andrasik, Patricia., Lechner, Norbert M., 2021. Heating, Cooling, Lighting: Sustainable Design Strategies Towards Net Zero Architecture. United Kingdom: Wiley.
3. Keeler Marian, Vaidya Prasad., Fundamentals of Integrated Design for Sustainable Building, Wiley; Latest edition

**Material**

4. Rangwala, S.C., 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
5. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

**Construction**

6. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead..
7. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).
8. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.

**Service**

9. S. C. Arora and S. Domkundwar, 2002. A Course in Refrigeration & Air conditioning, Dhanpat Rai and Company.
10. Hanes, Roger W and Myers, Michael E, HVAC System design handbook, McGraw Hill Education, New York.
11. Ramsey C. G. and H. R. Sleeper, 2011. Architectural Graphic Standards (HVAC System), John Wiley & Sons.
12. Aly S. Dadras, 1995. Mechanical Systems for Architects, McGraw-Hill.

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**SEMESTER 8 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/ Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR81 X	Vertical Studio 2	12	12	1200	600	600	300	300	-	-
2	20BAR83	Management and Interior Systems	6	6	600	300	300	100	100	100	3 Hours
3	20BAR85	Dissertation	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*One elective course of 3 credits is recommended.

X Course Number e.g., 1,2,3 etc.

**Vertical Studio Options\***

- 1 Vertical Studio 2: Advanced Design
- 2 Vertical Studio 2: Conservation
- 3 Vertical Studio 2: Landscape
- 4 Vertical Studio 2: Sustainability
- 5 Vertical Studio 2: Urban Housing

\*The Vertical Studio options listed above will be offered at the discretion of the Institute. Conditions Apply.

**Semester 8**  
**Vertical Studio 2: Advanced Design**

**Course Code: 20BAR811**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Basic knowledge of Rhino

**Course Description**

The course explores the relation between form, site, and program through research interrogation aimed at creating new knowledge and design innovation. In the dynamic world, which is at constant flux (change) both at the social and technological domains, the intention is to prepare students to respond positively to these changes by emphasizing on the underlying human values through design. To provide thorough understanding of technical, and advanced design & fabrication fundamentals along with a strong exposure to real life situations and problems that enables them to experience how creative skills can be adopted to benefit user and society. The focus of the studio is to develop innovative thinking and impart necessary technical skills/ ability to locate individual design approaches in an identified context. The aim is to reconfigure learning patterns that are inspired by a desire to harness increasingly sophisticated digital technologies in architectural detailing and fabrication. At the heart of this course is the parametric design processes that are used for exploring and fabricating complex geometries as modules.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written		
								Int.	Ext.	Marks	Duration of Exam	
Per week	2	4	6	12								
Per semester	30	60	90	180	600	600	1200	300	300	-	-	

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Evaluate</b>	CO1	Able to actively engage with emerging issues that concern habitat and deliberate design solutions for the same.
<b>Analyse</b>	CO2	Able to analyse real life situations and problems. Further, adopt advanced design & fabrication techniques to benefit user and society.
<b>Create</b>	CO3	To inquire into the varied nature and practice of computation in architectural design, and how design meaning, intentions, and knowledge are constructed through parametric thinking, representing, sensing, and making.
<b>Apply</b>	CO4	To be able to demonstrate Detailed Architectural interventions using the digital parametric tool.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	1	1	-	-	2	2	2	—	Unrelated
CO2	-	—	1	1	2	-	2	1	Indirectly Related
CO3	-	-	1	1	2	-	2	2	Directly Related
CO4	-	1	2	2	-	1	-		

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Remember	CO2	Ability to recognize the fundamentals of parametric and generative designs, and the basic parameters and codes that shall be used.	Self- directed study/ Workshop/ Lecture/ Studio	30
	1.2	Understand	CO1	Modular Production employing emerging technologies and detailing of assemblies.		
	1.3	Understand	CO3	Maximising structural efficiency and minimising material consumption.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Studio	2.1	Analyse	CO1	To identify emerging issues that concerns life, through built habitat and deliberate a design program to provide Design and build solution.	Self-directed study/ Research/ Studio	60
	2.2	Apply	CO1	Developing determinants and parameters derived through Architectural interrogation of the chosen scenario.		
	2.3	Evaluate	CO4	To be able to develop an Opportunity to integrate projects towards in-depth architectural assemblage in terms of self-sufficiency, as well as the inherent material, organisational and structural innovation.		
	2.4	Create	CO3	To create design and prototype build solutions by using advanced mediums of production and fabrication.		
	2.5	Apply	CO1	To be able to provide realistic design solutions at macro, miso, and micro levels right from a community level, to an individual product level. Innovative design solutions shall be proposed through parametric analysis, documentation.		
3. Workshop	3.1	Understand	CO1	Introduction to Fabrication Processes; Subtractive Fabrication and Additive Fabrication tool, Material Analysis and Form and element Exploration.	Workshop/ Studio	90
	3.2	Apply	CO2	Shape representation, Shape generation and shape analysis using computation modelling like Rhinoceros + Grasshopper, Solid works, Dynamo		
	3.3	Create	CO4	The act of making prototypes through realistic design solutions with parametric models using Fab lab and CAM process		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment review	30	60	Review (Portfolio/ Digital Portfolio/ Report)	60
	1.2					
	1.3					
2. Studio	2.1	Seminar/ Jury/ Time problem	60	360	Review (Portfolio/ Digital Portfolio/ Report)	360
	2.2					
	2.3					
	2.4					
	2.5					
3. Workshop	3.1	Jury	90	180	Review (Portfolio/ Digital Portfolio/ Report)	180
	3.2					
	3.3					

**References**

1. "McWilliams, Chandler, and Casey Reas. 2013. Form + code in design, art, and architecture. New York: Princeton Architectural.
2. Frazer, John. 1995. An Evolutionary architecture. London: Architectural Association.
3. Sakamoto, Tomoko. 2008. From Control to Design. New York City: Actar D.
4. Botos, a., Alonso Candau, R., Hatzitheofilou, O-g., Gao, X., Heinz, E., Minh-chau, N., ... Österlund, T. 2013. Digital Design in Sustainable Urbanism - Explorations in Computational Design Strategies. Tampereen Teknillinen Yliopisto. Arkkitehtuurin Laitos
5. Weaver, James C., Joanna Aizenberg, Georg E. Fantner, David Kisailus, Alexander Woesz, Peter Allen, Kirk Fields, et al. 2007. "Hierarchical assembly of the siliceous skeletal lattice of the hexactinellid sponge Euplectella aspergillum". Journal of Structural Biology. 158 (1): 93-106.
6. Wen L, JC Weaver, and GV Lauder. 2014. "Biomimetic shark skin: design, fabrication and hydrodynamic function". The Journal of Experimental Biology. 217: 1656-66.
7. "THOMAS MICAL | Bauhaus, Futurism, Dystopia Architecture | Grupa Interfaces." YouTube. December 01, 2020. [https://www.youtube.com/watch?v=7H0w\\_\\_faKM8](https://www.youtube.com/watch?v=7H0w__faKM8).

8. [From control to design: parametric algorithmic architecture. 2008. New York: Actar-D USA.
9. Moore, Jeffrey H., and Kenneth Clowes. 1974. DYNAMO primer. [Stanford]: Graduate School of Business, Stanford University.
10. Dynamo Primer - <http://primer.dynamobim.org>
11. Dewey, John. 1934. Art as experience, by John Dewey. New-York: Minton, Balch and Co. (Chapters 1 & 3).
12. Wallace, Emily. 2012. Pure Imagination. <https://www.good.is/articles/pure-imagination>
13. Buchanan, Richard. 1992. "Wicked Problems in Design Thinking". Design Issues. 8 (2): 5-21.
14. Weinschenk, Susan. 2020. 100 Things Every Designer Needs to Know About People, 2nd Edition.
15. Brownell, Blaine Erickson. 2017. Trans material next: a catalog of materials that redefine our future. New York: Princeton Architectural Press.
16. Stickdorn, Marc, and Jakob Schneider. 2010. This is service design thinking: basics--tools--cases. Amsterdam: BIS Publishers.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 8**  
**Vertical Studio 2: Conservation**

**Course Code: 20BAR812**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course is vertical studio between the 8<sup>th</sup> and 10<sup>th</sup> semester, where students will develop skills in analyzing historic settlements in a systematic method. They will also learn to document the heritage structures to be able to identify, protect and preserve the heritage and its values.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
<b>Per week</b>	2	4	6	12	600	600	1200	300	300	-	-
<b>Per semester</b>	<b>30</b>	<b>60</b>	<b>90</b>	<b>180</b>							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Analyze</b>	<b>CO1</b>	To identify and categorize Heritage buildings.
<b>Evaluate</b>	<b>CO2</b>	Develop a wider understanding of the notion & nature of 'heritage' and its values.
<b>Apply</b>	<b>CO3</b>	Help to develop skills in observation, recording, documenting, analysis, understanding, and evaluation of historic buildings and places so that students become more knowledgeable and sensitive to the built environment.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
<b>CO1</b>	1	1	1	2	2	—	1	—	Unrelated
<b>CO2</b>	-	—	1	1	-	2	-	1	Indirectly Related
<b>CO3</b>	2	2	2	2	2	-	1	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Lecture</b>	1.1	Remember	<b>CO1</b>	To identify and categorize Heritage buildings and Summarize the knowledge of philosophy in conservation.	Class exercise/ Self-directed study/ Studio	<b>30</b>
	1.2	Remember	<b>CO1</b>	To familiarise students on the protection, preservation and continuity of the significant aspects of culture and its expression.		
	1.3	Communicate	<b>CO1</b>	Interpret history in an unconventional way.		
<b>2. Studio</b>	2.1	Understand	<b>CO3</b>	Identify various construction techniques and material used in historic buildings	Research/ Lecture/ Studio	<b>60</b>
	2.2	Analyse	<b>CO2</b>	the course helps to develop skill in observation, recording, documenting, analysis, understanding and evaluation of historic building		
	2.3	Apply	<b>CO3</b>	Develop a critical understanding of the history, theory and ethics of cultural heritage conservation;		
<b>3. Workshop/ Fieldwork</b>	3.1	Analyse	<b>CO3</b>	Develop skill to document historical buildings.	Fieldwork/ Workshop	<b>90</b>
	3.2	Evaluate	<b>CO1</b>	To identify and categorize Heritage buildings taking an example of historical settlement.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Assignment review/ Written assignment review/ Time problem	30	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	1.2					
	1.3					
2. Studio	2.1	Jury/ Assignment Review	60	300	Review (Portfolio/ Digital Portfolio/ Report)	300
	2.2					
	2.3					
3. Workshop/ Fieldwork	3.1	Jury	90	150	Review (Portfolio/ Digital Portfolio/ Report)	150
	3.2					

**References**

1. N. Thakur. 2011. Indian Cultural Landscapes: Religious pluralism, tolerance and ground reality. School of Planning and Architecture, Bhopal.; <https://architexturez.net/doc/az-cf-21175>
2. N. Thakur. 2002. The Architectural Knowledge Systems Approach. Architexturez Imprints.; <https://architexturez.net/doc/az-cf-21179>
3. Jokilehto, Jukka. 2018. A history of architectural conservation. New York: Routledge

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 8**  
**Vertical Studio 2: Landscape**

**Course Code: 20BAR813**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The studio is run vertically between semester eight and semester ten and focuses on understanding the different environmental stressors to design sustainable landscapes. The studio pursues to unravel the inherent scope of landscape design approaches and intervention possibilities to mitigate challenges posed by diversified landscapes. The method seeks to sustainably resolve and design the way forward for such spaces to manage, conserve and transform them by addressing a range of site planning concepts, design methodologies, and landscape management techniques. The sites explored can range from brownfield sites, regenerative landscapes, mixed-use developments, waterfront promenades, transportation hubs, and open space corridors, where functional networks, development and revitalization opportunities may provide spaces that improve and maximize the public realm experience.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written		
								Int.	Ext.	Marks	Duration of Exam	
Per week	2	4	6	12								
Per semester	30	60	90	180	600	600	1200	300	300	-	-	

**Course Outcomes**

Domain/ Level	Outcomes	
Understand	CO1	Understand different landscape sites and the parameters influencing them.
Understand	CO2	Identify different landscape sites and express them succinctly through drawing techniques. Further, identify the parameters which influence them.
Create	CO3	Developing site-sensitive sustainable design solutions to address the multitudes of influencing parameters at both micro and macro scale.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	—	1	—	1	—	—	—	Unrelated
CO2	2	1	2	1	1	-	-	1	Indirectly Related
CO3	1	1	2	1	1	-	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	Understanding the different parameters for effective site planning	Self-directed study/ Lecture/ Studio/ Seminar	30
	1.2	Remember	CO2	Detailed study of Contemporary trends in Landscape Design components and techniques		
2. Studio	2.1	Analyse	CO2	Detail out issues pertaining to the site and its context	Self-directed study/ Research/ Studio	60
	2.2	Apply	CO2	Correlate the varying factors that interplay in a landscape setting		
	2.3	Create	CO3	Design considering sustainable aspects by holistically addressing micro and macro scale of implication.		
	2.4	Evaluate	CO3	Planning strategies to address the management of landscape site understanding the future stressors.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
3. Workshop/ Fieldwork	3.1	Evaluate	CO2	Study, analyse and document the site so as to understand the intricacies of the site and the context to decipher the issues of varying levels of complexities	Fieldwork/ Research/ Seminar	90
	3.2	Analyse	CO3	To explore the different landscape sites and effective intervention strategies through case studies and deducing a framework to understand sites at both micro and macro levels		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment review	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	1.2					
2. Studio	2.1	Seminar/ Jury/ Time problem	60	300	Review (Portfolio/ Digital Portfolio/ Report)	300
	2.2					
	2.3					
	2.4					
3. Workshop/ Fieldwork	3.1	Seminar/ Jury	90	200	Review (Portfolio/ Digital Portfolio/ Report)	200
	3.2					

**References**

- Jellicoe, Geoffrey, and Susan Jellicoe. 1987. The landscape of man: shaping the environment from prehistory to the present day. London: Thames and Hudson.
- Eckbo, Garrett. 1964. Urban landscape design. New York: McGraw Hill.
- The landscape urbanism reader. 2012. New York, NY: Princeton Architectural Press.
- Schama, Simon. 1995. Landscape and memory. London: HarperCollins Publishers.
- Wilson, Edward O. 2014. The future of life. London: Abacus

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 8**  
**Vertical Studio 2: Sustainability**

**Course Code: 20BAR814**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

An increase of 400% in the aggregate floor area of buildings and 20 billion m<sup>2</sup> of new building floor area is expected by 2030. This growth of floor space, combined with expectations of improved domestic comfort, will require an increase in electricity production, leading to a significant escalation in damaging emissions. To mitigate this, the course focuses on preparing the next generation of architects who will be able to design the building keeping in mind the passive design measures that will reduce energy consumption. Students will develop an understanding of how the building envelope works; and how it acts as a boundary between interior and exterior space. They will also learn to make the building thermally efficient so that it can meet the user's comfort expectations. This would be done by using the natural ventilation/passive cooling systems and then using active cooling systems when the outdoors is not comfortable. Furthermore, the students will learn, not only to design using passive solar principles, but also learn how to quantify the performance of their design.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	4	6	12	600	600	1200	300	300	-	-
Per semester	30	60	90	180							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Create</b>	<b>CO1</b>	Apply the fundamentals of passive design/climatology right at the conceptual design stage to formulate the building envelope (like generate building form, defining Aspect Ratio, defining Orientation, and defining Window to Wall Ratio) and choosing sustainable materials.
<b>Create</b>	<b>CO2</b>	Choose building envelope materials as per the context of the location. Furthermore, detail the design interventions (building wall section, roof sections, etc) using passive design principles to have buildings thermally comfortable.
<b>Analyse</b>	<b>CO3</b>	Analyse the design for its energy and lighting-daylighting performance. Identify the annual energy consumption of the building. Furthermore, suggest changes in building design to reduce the energy consumption

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	-	1	2	2	1	1	2	—	Unrelated
CO2	2	1	2	2	2	2	2	1	Indirectly Related
CO3	-	1	2	2	2	2	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Lecture</b>	1.1	Remember	CO 1	Passive solar design-introduction, parameters of climate, weather files	Self-directed study/ Research / Lecture	<b>30</b>
	1.2	Remember	CO 3	Understanding basics of active and passive cooling systems. Integrating low energy cooling techniques in the building designs and services.		

	1.3	Understand	CO 3	Understanding of lighting-daylighting systems in the building.		
<b>2. Studio</b>	2.1	Apply	CO 1	Apply the basics of passive solar to generate the building form, orientation, aspect ratio etc.	Workshop/ Studio	<b>60</b>
	2.2	Create	CO 2	Create building wall/roof section based on the informed decision. Generate design by understanding thermal properties of the materials.		
	2.3	Create	CO 2	Design appropriate shading so as to protect the building from direct solar gains and to cut the glare		
	2.4	Communicate	CO 1	Establish the design intent even before the beginning of the conceptual stage		
	2.5	Create	CO 2	Generate full building designs with understanding of the passive solar principles		
<b>3. Workshop</b>	3.1	Create	CO 3	Create model geometry for thermal energy simulations. Also figure out the inputs required for the energy modelling	Research / Workshop	<b>90</b>
	3.2	Analyse	CO 3	analyse the results from the building thermal simulation		
	3.3	Evaluate	CO 3	Evaluate the overall building performance for the parameters like EUI (energy use intensity), CUI (carbon use intensity), and daylight performance. Compare it against the benchmark building. This could be a potential paper/essay or could be published as portfolio on any online platform.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
<b>1. Lecture</b>	1.1	Assignment review	<b>30</b>	<b>150</b>	Review (Portfolio/ Digital Portfolio/ Report)	<b>150</b>
	1.2					
	1.3					
<b>2. Studio</b>	2.1	Seminar/ Jury/ Time problem	<b>60</b>	<b>300</b>	Review (Portfolio/ Digital Portfolio/ Report)	<b>300</b>
	2.2					
	2.3					
	2.4					
	2.5					
<b>3. Workshop</b>	3.1	Jury/ Assignment review/ Written assignment review	<b>90</b>	<b>150</b>	Review (Portfolio/ Digital Portfolio/ Report)	<b>150</b>
	3.2					
	3.3					

**References**

1. GBPN - Reports. Global Buildings Performance Network. (2019, January 1). <https://www.gbpn.org/reports>.
2. Bureau of Energy Efficiency (BEE). 2017. Energy Conservation Building Code. New Delhi: BEE.
3. Keeler, Marian, and Prasad Vaidya. 2016. Fundamentals of integrated design for sustainable building. Hoboken, New Jersey: Wiley
4. Brackney, Larry. Parker, Research Consultant Andrew. Macumber, Daniel. 2019. Building Energy Modeling with Open studio: a practical guide for students and professionals. [Place of publication not identified]: SPRINGER.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 8**  
**Vertical Studio 2: Urban Housing**

**Course Code: 20BAR815**
**Credits: 12**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Housing Studio and Urban Studio

**Course Description**

The studio addresses the various ideas of housing, such as affordable housing and traditional, cultural can be maintained and how to balance development at the suburban and urban with the needs of the neighbourhood development ideas. To answer these concerns, students interact with residents, city officials, and experts on transportation and real estate. They assess strategic options for the neighbourhood and propose comprehensive plans for the housing program, design, and development of the identified site. Proposals shall range from establishing the area as a regional logistics centre to creating a living and working cultural oasis in the urban context.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
					Int.	Ext.	Marks	Duration of Exam			
Per week	2	4	6	12							
Per semester	30	60	90	180	600	600	1200	300	300	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Evaluate</b>	<b>CO1</b>	Understand and discuss issues relevant to housing design in India
<b>Apply</b>	<b>CO2</b>	To develop strategies and interventions concerning different scopes of sites chosen within the areas of development, including the core, the peri-urban, and the suburban.
<b>Create</b>	<b>CO3</b>	Explore different urban housing parameters for further explorations and Design using an iterative design method
<b>Analyse</b>	<b>CO4</b>	Correlate multiple contextual factors with specific design decisions.
<b>Evaluate</b>	<b>CO5</b>	Analyse the values implicit in each of their proposals, stressing the connections between ideas and design.
<b>Create</b>	<b>CO6</b>	Create a master plan with all the necessary systems in place including the basic infrastructure and planning housing strategies based on concerns raised on-site, after analysis.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	-	—	—	1	2	2	2	—	Unrelated		
CO2	-	1	2	2	1	1	—	1	Indirectly Related		
CO3	-	1	1	1	—	1	2	2	Directly Related		
CO4	1	1	-	-	2	1	2				
CO5	—	1	1	—	1	1	1				
CO6	1	1	2	2	1	2	2				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Analyse	CO1	Understanding and analysing a housing project over the years to study and realize the course of the path it has evolved into- how the visualized spaces in the master plan changed, the extension of housing-incremental, encroaching of common community spaces, and so on. This exercise will help the students get a better insight into how the spaces are manipulated over time and can help to	Self-directed study/ Field work/	30

				touch upon community-driven changes that are inevitable in the process. Thus, allowing them to propose a system dependent program.	Lecture	
	1.2	Apply	CO2	The course aims to study and throw light on the impact of mass housing on the existing urban environment and life of people.		
2. Studio	2.1	Understand	CO1, CO2	The studio addresses the various ideas of housing, such as affordable housing and traditional, cultural can be maintained and how to balance development at the suburban and urban with the needs of the neighbourhood development ideas. To analyse, and document a) Housing clusters in a city? b) What affects the housing sector? c) Various housing layers that the city has within itself.	Research/ Field work/ Studio	60
	2.2	Apply	CO3, CO4	To answer these concerns, students interact with local residents, city officials and experts on transportation and real estate.		
	2.3	Analyse	CO5	They assess strategic options for the neighbourhood and propose comprehensive plans for the housing program, design and development of the identified site.		
	2.4	Create	CO6	Proposals shall range from establishing the area as a regional logistics centre to creating a living and working cultural oasis in the urban context.		
3. Workshop/ Fieldwork	3.1	Understand	CO3, CO4	The lab or the fieldwork component of the studio will have the site visit in it, where, for a certain period, the students shall stay in site and complete the basic works of documenting the same.	Field work/ Workshop	90
	3.2	Analyse	CO5	The workshop component of the studio can further have a research workshop, where the students can take up various urban concerns and then conduct primary or even secondary research on the same.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Time problem/ Assignment review	30	100	Review (Portfolio/ Digital Portfolio/ Report)	100
	1.2					
2. Studio	2.1	Jury/ Assignment review	60	300	Review (Portfolio/ Digital Portfolio/ Report)	300
	2.2					
	2.3					
	2.4					
3. Workshop/ Fieldwork	3.1	Jury/ Assignment review/ Written Assignment Review	90	200	Review (Portfolio/ Digital Portfolio/ Report)	200
	3.2					

**References**

1. Carmona, Matthew. 2017. Housing Design Quality: through policy, guidance and review.: Routledge.
2. Franklin, Bridget. 2006. Housing transformations: shaping the space of twenty-first century living. New York: Routledge.
3. Biddulph, Mike. 2016. Introduction to residential layout. London: Routledge.
4. Morris, Marya. 2000. Incentive zoning: meeting urban design and affordable housing objectives. Chicago, IL: American Planning Association.
- 3 Habraken, N. J., and Bastiaan VALKENBURG. 1972. [De dragers en de mensen.] Supports: an alternative to mass housing ... Translated ... by B. Valkenburg. London: Architectural Press.
- 4 Turner, John F. C., and Colin Ward. 2017. Housing by people: towards autonomy in building environments. New York: Marion Boyars.
- 5 Turner, John F.C., and Robert Fichter. 1972. Freedom to build dweller control of the housing process. New York: Macmillan.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 8**  
**Management and Interior Systems**

**Course Code: 20BAR83**
**Credits: 6**

<b>Type of Course:</b>	<b>Building Sciences and Applied Engineering Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course gives an introduction to interior design as a building stream. Visualization of interior spaces concerning light, color, and functional aspects; use of materials in specific site conditions depending on their typology such as residences, restaurants, cinemas, auditoriums, planetariums will be the focus of the course. Impart project management skills with particular reference to construction management, so that students can learn to formulate projects while dealing with all organizational, technical, financial, human resource-related, and quality issues. Develop a basic understanding of the principles of architectural acoustics, the way we hear and perceive sound both indoors and outdoors, the appropriate criteria for listening environment and acoustical privacy, and the architectural decisions of layout and material selection in design.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	2	2	6	300	300	600	100	100	100	3 Hours
Per semester	30	30	30	90							

**Course Outcomes**

Domain/ Level	Outcomes	
Apply	CO1	To demonstrate a basic understanding of Construction Management, conduct project planning activities that accurately forecast project costs, timelines, and quality, and implement processes for successful resource, communication, and risk and change management.
Analyze	CO2	To comprehend materiality concerning the indoor environments and be able to distinguish and adopt sustainable and suitable materials for the interiors of varied building typologies.
Create	CO3	To describe the fundamental designing and detailing of interior spaces, to analyze and use construction materials, and to prepare schematic, detail, construction drawings, working details, and cost.
Apply	CO4	To comprehend the concepts used in architectural acoustics and to be able to identify, discuss and resolve acoustical problems related to architectural acoustics, and acoustic comfort.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	2	2	2	—	2	2	—	Unrelated		
CO2	2	—	2	1	1	-	2	1	Indirectly Related		
CO3	2	1	2	2	1	-	2	2	Directly Related		
CO4	2	2	2	2	2	2	2				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Management	1.1	Understand	CO1	Introduction to construction management, need and importance, objectives and functions of project or construction management, role of Project or Construction Managers in the building industry, Project feasibility reports, Project management cycle - planning, scheduling, monitoring and controlling	Class exercise/ Self- directed study/ Lecture	30
	1.2	Remember	CO1	Types of projects, Construction procedures: Different methods of construction, types of contracts, Prequalification procedure, earnest money deposit, security deposit, contract document – general and special conditions of contract, measurement book, The FIDIC Suite of Contracts, disputes and their settlement		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.3	Analyse	CO1	Introduction to construction scheduling techniques - Bar chart / Gantt chart, Work breaks down structure (WBS), Network representation, Principles and application of CPM & PERT, Network analysis, development of CPM network, Identification of critical path, Different float computations, PERT Network - Probabilistic time estimates of activities, Analysis of PERT Network, Development of Critical path.		
	1.4	Apply	CO1	Construction cost and budget: Construction cost, Classification of construction cost, Unit rate costing of resources, Budget, Types of budgets, Project Master budget, Time value of money, cash flow, depreciation, cost benefit analysis Risk and safety management in construction – causes of risk, Risk management policies, Safety measures in different stages of construction, occupational and safety hazard assessment, implementation of Safety programme		
	1.5	Apply	CO1	Concept of materials management, Inventory, inventory control, Economic order quantity, Safety stock, ABC analysis. Project management information system: PMIS Concept, Information system computerization, Problems in information system management, Benefits of computerized information system, Project management software packages.		
2. Materials	2.1	Analyse	CO2	Study of Materials: Understand the characteristics and workability of materials used in interiors. Study of materials can be based on the elements of usage as below.	Self-directed study/ Research / Field work/ Studio	15
	2.2	Understand	CO2	Surface finishings of walls using varied range of materials (wallpapers, veneers, laminates, stone tiles),		
	2.3	Understand	CO2	Partitions and panelling's (glass, ceramics, Prefab designer panels)		
	2.4	Understand	CO2	Flooring (stones, tiles, sheets, carpets, veneers) Ceilings (gypsum boards, insulation materials) etc.		
	2.5	Understand	CO2	The material costs, properties, advantages/ disadvantages, lifecycle through market surveys		
3. Construction	3.1	Understand	CO 3	Introduction to interior design. Understanding light, colour and functional aspects of space (utilization)	Research / Field work/ Studio	15
	3.2	Analyse	CO 3	Introduction to the basic idea of materiality, understanding and visualizing the strengths and weaknesses, finishes and constructional details of fixing of each material in different settings like residences, restaurants, cinemas, auditoriums, planetariums etc.		
	3.3	Evaluate	CO 3	Understanding the role of acoustics and lighting in interior spaces - going through various case studies. Identifying and collecting materials for market study		
	3.4	Understand	CO 3	Introduction to properties and applications of fire proofing, thermal insulation and sound insulation		
	3.5	Understand	CO 3	Introduction to prefabricated materials and their applications.		
4. Services	4.1	Remember	CO4	Introduction to Architectural acoustics: The nature of sound - propagation of sound-velocity, frequency and wavelength of sound. Sound pressure - Sound intensity and loudness- Decibel and Phons- The human ear and hearing characteristics - Instruments and equipment	Class exercise/ Field work/ Workshop/ Lecture	30
	4.2	Understand	CO4	Room Acoustics Behaviour of sound in enclosed spaces. Sound Absorption. Sound absorption coefficient, Sound absorbing materials, porous materials, Panel materials, Resonators, Space absorbers - variable absorbers.		
	4.3	Understand	CO4	Concept of reverberation and reverberation time. Calculation of reverberation time - Sabine's formula. Acoustical defects in the enclosed spaces.		
	4.4	Understand	CO4	Effect of noise on human beings Noise sources - air borne and structure borne- Methods of preventing air borne and structure borne noises by landscaping, campus planning and building design. Sound transmission - Noise criteria –NC curve - Transmission loss - permissible noise levels for different types of spaces.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	4.5	Apply	CO4	Design Principles of Auditorium Different acoustical defects in auditoriums and their solutions, acoustical correction design and modification techniques.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Management	1.1	Written test/ Assignment review/ Written assignment review*	30	100**	Written Exam	100
	1.2					
	1.3					
	1.4					
	1.5					
2. Materials	2.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio/ Report)	50
	2.2					
	2.3					
	2.4					
	2.5					
3. Construction	3.1	Seminar/ Jury/ Assignment review	15	50	Review (Portfolio/ Digital Portfolio)	50
	3.2					
	3.3					
	3.4					
	3.5					
4. Services	4.1	Seminar/ Jury/ Assignment review	30	100	Review (Portfolio/ Digital Portfolio)	100
	4.2					
	4.3					
	4.4					
	4.5					

\*Mandatory Project Report component for at least one Unit.

\*\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50% weightage of the total CIE for that module.

**References**
**Management**

1. Dr. Seetharaman S, 2015. Construction Engineering and Management, Umesh Publications, Delhi.
2. Hajdu M., 2013. Network Scheduling Techniques for Construction Project Management, Springer U S.
3. Bhattacharjee S. K, 2004. 'Fundamentals of PERT/CPM and Project Management', Khanna Publishers.

**Material**

4. Rangwala, S.C. , 2008. Engineering Materials [Material Science] (Latest edition). Charotar Publishing House Pvt. Limited.
5. Kumar, S. 2010. Building construction (Latest edition). New Delhi, India: Standard Publishers and Distributors.

**Construction**

6. McKay, William Barr. 2005. McKay's building construction (Latest edition). Shaftesbury: Donhead..
7. Chudley, R., Roger Greeno, and Karl Kovac. 2020. Chudley and Greeno's building construction handbook (Latest edition).
8. Punmia, B. C., Ashok Kumar Jain, and Arun Kumar Jain. 2009. Building construction (Latest edition). New Delhi: Laxmi Publications (P) Ltd.

**Services**

9. Cavanaugh, William J., Gregory C. Tocci, and Joseph A. Wilkes. 2010. Architectural acoustics: principles and practice. Hoboken, N.J.: John Wiley & Sons.
10. Moore. 1988. Design for Good Acoustics and Noise Control. Macmillan Education.
11. Ducan Templation, 1997. Acoustics in the built environment, Oxford; Boston: Architectural Press.
12. Egan M. D., 1988. Architectural Acoustics, Mc Grawhill Inc.

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**Semester 8  
Dissertation**

**Course Code: 20BAR85**
**Credits: 3**

<b>Type of Course:</b>	<b>Professional Ability Enhancement Course</b>
<b>Prerequisites:</b>	Cooperative Learning and Urban Studio/Exchange Studio

**Course Description**

The course in the eighth-semester level shall fundamentally address the concern of giving the students, exposure to the various practices of research, through the understanding of basic framing in research methodology stage to the stage of formal writing exercises, of both scientific or technical research, on one hand, and artistic or humanistic research on the other, based on ones' interest. This course through its outcomes shall further act as one of the prerequisites to the thesis in the tenth semester.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	2	-	1	3	150	150	300	75	75	-	-
Per semester	30	-	15	45							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	<b>CO1</b>	Identify and express the anatomy of the basic research methodologies with necessary literature studies. Further, identify the literature sources as well as structure a technical report through appropriate research typology.
<b>Analyse</b>	<b>CO2</b>	The student will have the comprehensive knowledge to collect, assimilate, and synthesize the data related to the specific research.
<b>Analyse</b>	<b>CO3</b>	The student will be capable of presenting the research in a formal and structured way of reports and presentations through technical representation skills.
<b>Evaluate</b>	<b>CO4</b>	The student will have the fundamental ability to critically think and enumerate the practical applications of various research conducted.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	2	1	2	1	2	-	-	—	Unrelated		
CO2	2	2	-	-	2	-	2	1	Indirectly Related		
CO3	-	2	—	—	2	—	-	2	Directly Related		
CO4	-	1	-	—	1	2	1				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	A series of guest lectures from multiple disciplines that will to give a wide variety of scope to choose the topic for dissertation.	Self-directed study/ Research/ Studio/ Seminar	30
	1.2	Communicate	CO3	Multiple writing exercises of synopsis, and initial abstract stages to understand and frame the research domain and its objective.		
	1.3	Apply	CO2	Relevant literature reviews and analysis that shall further help in framing the research methodology.		

	1.4	Analyse	CO2, CO4	Necessary experiments, studies and analysis to be conducted, and various methods of data analysis shall be carried out, moving towards the results and discussion part of the study and scope of the project to evaluate on the application aspect of the research.		
	1.5	Create	CO3	Presentation skills to be delivered and evaluated through technical writing skills (Report writing) and oral presentations (Seminars) as a module, which could result in a paper presentation.		
2. Workshop/ Fieldwork	2.1	Analyse	CO2	The lab or the fieldwork component of the Course shall have the site visit in it, where, for a certain period of time, the students shall stay in site and complete the basic works of documenting the same, based on the requirement of the topic.	Fieldwork/ Workshop	15
	2.2	Communicate	CO3	The workshop component of the course can further have a research workshop, where the students are helped with external resource people, who shall help them in technical writing skills, and publishing.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/ Jury/ Written assignment review	30	100	Review (Report)	100
	1.2					
	1.3					
	1.4					
	1.5					
2. Workshop/ Fieldwork	2.1	Seminar/ Written assignment review	15	50	Review (Presentation)	50
	2.2					

**References**

1. Wiseman, Carter. 2014. Writing Architecture: A Practical Guide to Clear Communication About the Built Environment. San Antonio: Trinity University Press.
2. Borden, Iain, and Katerina Ruedi Ray. 2014. The Dissertation: A Guide for Architecture Students. Routledge.
3. Groat, Linda N., and David Wang. 2013. Architectural Research Methods. John Wiley & Sons.
4. Fischer, Tom. Architectural Research. <https://rp.design.umn.edu/resources/documents/ArchGraphStand15.pdf>
5. Sommer, Barbara, and Robert Sommer. 2002. A Practical Guide to Behavioral Research: Tools and Techniques. New York: Oxford University Press.
- 3 Creswell, John W., and J. David Creswell. 2020. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Thousand Oaks, California: Sage Publications.
- 4 Dahl, A., Dich, T., Hansen, T., Olsen, V. 1999. Strengthen Project Work: A Tool book for Problem-based Project Work. [Styrk projektarbejdet: En redskabsbog til problemorienteret projektarbejde]. Biofolia, Frederiksberg.
- 5 Rienecker, L. and Jørgensen, P.S. 2006. The Good Assignment. [Den gode opgave]. 3rd Edition. Forlaget Samfundslitteratur, Frederiksberg.
- 6 Yin, R.K. 2003. Case Study Research: Design and Methods. Applied Social Research Methods Series 5. Sage, Thousand Oaks.
- 7 "Formatting Your Dissertation." Formatting Your Dissertation. <https://gsas.harvard.edu/degree-requirements/dissertations/formatting-your-dissertation>.
- 8 "Format Requirements for Paper Dissertation." Format Requirements for Paper Dissertation | Registrar's Office. <https://registrar.stanford.edu/students/dissertation-and-thesis-submission/preparing-dissertations-paper-submission/format>.

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**SEMESTER 9 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR95	Internship	—*	24	2400	1200	1200	600	600	-	-
<b>Total</b>			—	<b>24</b>							

\* As per Regulations

**Semester 9  
Internship**

Course Code: 20BAR95

Credits: 24

Type of Course:	Professional Core Courses
Prerequisites:	None

**Course Description**

To gain practical experience and be exposed to the various facets of architectural practice through an internship at an established architectural studio.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	—	—	—	-*	1200	1200	2400	600	600	—	—
Per semester	—	—	—	-*							

\*As per Regulations

**Course Outcomes**

Domain/ Level	Outcomes	
Apply	CO1	Identify and understand the role of architects in the practice and build skills for taking actions on-site decision-making process
Apply	CO2	Assess the self's ability to execute the knowledge and learning gained during the academic period to deliver a successful project.
Apply	CO3	Build a proactive attitude for problem-solving and decision-making. Further, ensure maximum development of required professional skills to formulate a proposal for execution of the project.
Create	CO4	Analyse and interpret learning of the design process and generate workable design solutions in architecture and construction technology.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:
CO1	1	1	2	2	1	2	2	— Unrelated
CO2	2	1	2	2	1	-	2	1 Indirectly Related
CO3	2	2	2	2	2	-	2	2 Directly Related
CO4	2	2	2	2	1	2	2	

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Workshop	1.1	Create	CO1 CO2 CO3 CO4	Students will have to undergo at least 16 working weeks of internship in the ninth semester as per the norms laid by the Competent Regulatory Authority, India in an approved firm established not less than five years with a registered architect. Students are expected to participate in and be exposed to the various facets of architectural practice through internship at an established architectural studio. To Understand the role and importance of the experience in practice and on-site decision-making process is a vital part of the course.	Self-directed study/ Research/ Studio/ Seminar	-

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Workshop	1.1	Progress Report	-	600	Review (Portfolio/ Digital Portfolio/ Report)	600

**SEMESTER 10 (LEVEL 3)**

Courses of Study and Training					Scheme of Examination						
S. No.	Course Code	Course Title	Number of Teaching Hours/Week	Credits	Marks			SEE Evaluation			
					Total Marks (CIE + SEE)	CIE	SEE	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
1	20BAR 101X	Architectural Thesis/ Capstone Project	15	15	1500	750	750	375	375	-	-
2	20BAR 105	Professional Practice	3	3	300	150	150	50	50	50	2 Hours
3	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
4	20BAR YY EX	Elective*	3	3	300	150	150	75	75	-	-
<b>Total</b>			<b>24</b>	<b>24</b>							

\*Two elective courses of 3 credits each are recommended.

*X Course Number e.g., 1,2,3 etc.*

**Architectural Thesis/**

**Capstone Project Options\***

0 Architectural Thesis

1 Capstone Project: Advanced Design

2 Capstone Project: Conservation

3 Capstone Project: Landscape

4 Capstone Project: Sustainability

5 Capstone Project: Urban Housing

\*The Capstone Project options listed above will be offered at the discretion of the Institute. Conditions Apply.

**Semester 10**  
**Architectural Thesis**

**Course Code: 20BAR1010**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

An undergraduate thesis should demonstrate an in-depth understanding of the chosen subject through methodical study. The thesis can be either research or design based.

Research Thesis: Selection of a theoretical premise, analysing against existing literature, and developing one's discourse on the topic.

Design Thesis: Selection of a theoretical or practical design issue, conducting mapping or analytical studies, developing a design framework using literature studies, case studies and research, and proposing a design solution at an appropriate scale to address the specific concern.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	-	15	-	15	750	750	1500	375	375	-	-
Per semester	-	225	-	225							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Create</b>	<b>CO1</b>	Build and formulate design ideas and proposals using appropriate media and representation techniques. Further, communicate ideas succinctly at each stage of the design process; additionally, culminate all the ideas into generating a complete design.
<b>Evaluate</b>	<b>CO2</b>	Articulate, propose, and defend ideas and positions on architecture.
<b>Create</b>	<b>CO3</b>	Demonstrate the ability to perform original, independent, research or design in a chosen field of interest.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
<b>CO1</b>	2	2	2	2	2	1	2	—	Unrelated
<b>CO2</b>	1	1	1	2	2	2	2	1	Indirectly Related
<b>CO3</b>	—	1	2	2	2	1	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
<b>1. Project</b>	1.1	Analyse	CO2	Raising clear and precise questions.	<b>Self-Directed Study/ Research/ Studio</b>	<b>225</b>
	1.2	Evaluate	CO3	Identifying, selecting, and engaging with architectural precedents and appropriate methods of research.		
	1.3	Analyse	CO3	Using abstract ideas to interpret information, and developing critical reasoning and thinking skills to reach well-reasoned conclusions.		
	1.4	Evaluate	CO2	Testing alternative outcomes against relevant criteria and standards.		
	1.5	Create	CO2	Taking firm positions, forming fresh perspectives, and proposing solutions for crucial architectural issues.		
	1.6	Create	CO1	Developing an individual position in relation to contemporary architectural discourse.		
	1.7	Communicate	CO1	Creating drawings, images, and models that effectively illustrate developing ideas.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.8	Communicate	CO1	Communicating effectively through systematic, clear and concise written reports and visual and oral presentations.		
	1.9	Create	CO3	Contributing to the existing knowledge related to the built environment.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Project	1.1	Assignment Review/Jury	225	750	Review (Portfolio/ Digital Presentation/ Report)	750
	1.2					
	1.3					
	1.4					
	1.5					
	1.6					
	1.7					
	1.8					
	1.9					

**References**

- Borden, Iain, and Katerina Ruedi Ray. 2014. *The Dissertation: A Guide for Architecture Students*. Routledge.
- Groat, Linda N., and David Wang. 2013. *Architectural Research Methods*. John Wiley & Sons.
- 'How to Choose an Undergraduate Architecture Thesis Topic'. 2017. ArchDaily. 11 September 2017. <https://www.archdaily.com/878664/how-to-choose-an-undergraduate-architecture-thesis-topic>.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Capstone Project: Advanced Design**

**Course Code: 20BAR1011**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Basic knowledge of Rhino and Grasshopper

**Course Description**

The studio is intended to foster discourse exploring the interrelationship between Architectural questions (raised through theories and intentions) and Form developed (space, shape, proportion, material, place, scale, geometry). The course explores the relationship between form, site, and program through research interrogation aimed at creating new knowledge and design innovation. In a dynamic world that is in constant flux (change) both in the social and technological domains, the intention is to prepare students to respond positively to these changes by emphasizing underlying human values through design. To provide a thorough understanding of technical, and advanced design & fabrication fundamentals along with a strong exposure to real-life situations and problems that enables them to experience how creative skills can be adopted to benefit users and society. The focus of the studio is to develop innovative thinking and impart the necessary technical skills/ ability to locate individual design approaches in an identified context. The aim is to reconfigure learning patterns that are inspired by a desire to harness increasingly sophisticated digital technologies in architectural detailing and fabrication. At the heart of this course is the parametric design processes that are used for exploring and fabricating complex geometries as modules.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	3	6	6	15							
Per semester	45	90	90	225	750	750	1500	375	375	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
Evaluate	CO1	Able to actively engage with emerging issues that concern habitat and deliberate design solutions for the same.
Analyse	CO2	Able to analyse real-life situations and problems and adopt advanced design & fabrication techniques to benefit users and society.
Create	CO3	To inquire into the varied nature and practice of computation in architectural design, and how design meaning, intentions, and knowledge are constructed through parametric thinking, representing, sensing, and making.
Apply	CO4	To be able to demonstrate Detailed Architectural interventions using the digital parametric tool.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	1	1	1	2	2	1	—	Unrelated		
CO2	2	—	2	1	2	2	2	1	Indirectly Related		
CO3	1	1	1	1	2	-	2	2	Directly Related		
CO4	2	2	2	2	2	2	1				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO2	Ability to recognize the fundamentals of parametric and generative designs, and the basic parameters and codes that shall be used.	Self-Directed Study/ Workshop/ Lecture/ Studio	45
	1.2	Understand	CO1	Modular Production employing emerging technologies and detailing of assemblies.		
	1.3	Understand	CO3	Maximising structural efficiency and minimising material consumption.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Studio	2.1	Analyse	CO1	To identify emerging issues that concerns life, through built habitat and deliberate a design program to provide Design and build solution.	<b>Self-Directed Study/ Research/ Studio</b>	<b>90</b>
	2.2	Apply	CO1	Developing determinants and parameters derived through Architectural interrogation of the chosen scenario.		
	2.3	Evaluate	CO4	To be able to develop an Opportunity to integrate projects towards in-depth architectural assemblage in terms of self-sufficiency, as well as the inherent material, organisational and structural innovation.		
	2.4	Create	CO3	To create design and prototype build solutions by using advanced mediums of production and fabrication.		
	2.5	Apply	CO1	To be able to provide realistic design solutions at macro, meso, and micro levels right from a community level, to an individual product level. Innovative design solutions shall be proposed through parametric analysis, documentation.		
3. Workshop	3.1	Understand	CO1	Introduction to Fabrication Processes; Subtractive Fabrication and Additive Fabrication tool, Material Analysis and Form and element Exploration.	<b>Workshop</b>	<b>90</b>
	3.2	Apply	CO2	Shape representation, Shape generation and shape analysis using computation modelling like Rhinoceros + Grasshopper, Solid works, Dynamo		
	3.3	Create	CO4	The act of making prototypes through realistic design solutions with parametric models using Fab lab and CAM process		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment Review	45	100	Review (Portfolio/ Digital Presentation/ Report*)	100
	1.2					
	1.3					
2. Studio	2.1	Seminar/ Jury/ Time Problem	90	450	Review (Portfolio/ Digital Presentation/ Report*)	450
	2.2					
	2.3					
	2.4					
	2.5					
3. Workshop	3.1	Jury	90	200	Review (Portfolio/ Digital Presentation/ Report*)	200
	3.2					
	3.3					

\* Project Report is mandatory for the Semester End Examination

**References**

- McWilliams, Chandler, and Casey Reas. 2013. Form + code in design, art, and architecture. New York: Princeton Architectural.
- Frazer, John. 1995. An Evolutionary architecture. London: Architectural Association.
- Sakamoto, Tomoko. 2009. From control to design: parametric/algorithmic architecture. Barcelona: Actar.
- Botos, a., Alonso Candau, R., Hatzitheofilou, O-g., Gao, X., Heinz, E., Minh-chau, N., ... Österlund, T. 2013. Digital Design in Sustainable Urbanism - Explorations in Computational Design Strategies. Tampereen Teknillinen Yliopisto. Arkkitehtuurin Laitos
- Weaver, James C., Joanna Aizenberg, Georg E. Fantner, David Kisailus, Alexander Woesz, Peter Allen, Kirk Fields, et al. 2007. "Hierarchical assembly of the siliceous skeletal lattice of the hexactinellid sponge Euplectella aspergillum". Journal of Structural Biology. 158 (1): 93-106.
- Wen, Li, James C. Weaver, and George V. Lauder. 'Biomimetic Shark Skin: Design, Fabrication and Hydrodynamic Function'. Journal of Experimental Biology 217, No. 10 (15 May 2014): 1656-66.
- "THOMAS MICAL | Bauhaus, Futurism, Dystopia Architecture | Grupa Interfaces." YouTube. December 01, 2020. [https://www.youtube.com/watch?v=7H0w\\_\\_faKM8](https://www.youtube.com/watch?v=7H0w__faKM8).
- "The Dynamo Primer." About | The Dynamo Primer. <https://primer.dynamobim.org/en/>

9. Dewey, John. 1934. Art as experience, by John Dewey. New-York: Minton, Balch and Co.
10. Wallace, Emily. 2012. Pure Imagination. <https://www.good.is/articles/pure-imagination>
11. Buchanan, Richard. 1992. "Wicked Problems in Design Thinking". Design Issues. 8 (2): 5-21.
12. Weinschenk, Susan. 2020. 100 Things Every Designer Needs to Know About People, 2nd Edition.
13. Brownell, Blaine Erickson. 2017. Trans material next: a catalogue of materials that redefine our future. New York: Princeton Architectural Press.
14. Stickdorn, Marc, and Jakob Schneider. 2010. This is service design thinking: basics--tools--cases. Amsterdam: BIS Publishers.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Capstone Project: Conservation**

**Course Code: 20BAR1012**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

This course is vertical studio between the 8th and 10th semesters, where students will develop skills in analysing historic settlements in a systematic method. They will also learn to document the heritage structures to be able to identify, protect and preserve the heritage and its values.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written		
								Int.	Ext.	Marks	Duration of Exam	
Per week	3	6	6	15								
Per semester	45	90	90	225	750	750	1500	375	375	-	-	

**Course Outcomes**

Domain/ Level	Outcomes	
Analyse	CO1	To identify and categorize Heritage buildings.
Evaluate	CO2	Develop a wider understanding of the notion & nature of 'heritage' and its values.
Analyse	CO3	Solve the gaps through layering of history with help of analysis to discover lost traditional knowledge systems in the relevant context.
Apply	CO4	Help to develop skills in observation, recording, documenting, analysis, understanding, and evaluation of historic buildings and places so that students become more knowledgeable and sensitive to the built environment.
Evaluate	CO5	Discover the traditional knowledge systems existing in the historic cities to establish values of tangible and intangible heritage.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	1	1	2	2	—	1	—	Unrelated		
CO2	-	—	1	1	-	2	-	1	Indirectly Related		
CO3	1	1	2	2	2	-	-	2	Directly Related		
CO4	2	2	2	2	2	-	1				
CO5	-	1	—	1	1	2	-				

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Remember	CO1	To identify and categorize Heritage buildings and summarize the knowledge of philosophy in conservation.	Class Exercise/ Self-Directed Study/ Lecture/Stu dio	45
	1.2	Understand	CO1	To familiarise students on the protection, preservation and continuity of the significant aspects of culture and its expression.		
	1.3	Communicate	CO1	Interpret history in an unconventional way.		
	1.4	Understand	CO5	To understand Philosophy of Conservation.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
2. Studio	2.1	Understand	CO4	Identify various construction techniques and material used in historic buildings	Research/ Lecture/ Studio	90
	2.2	Analyse	CO2	the course helps to develop skill in observation, recording, documenting, analysis, understanding and evaluation of historic building		
	2.3	Apply	CO4	Develop a critical understanding of the history, theory and ethics of cultural heritage conservation		
	2.4	Analyse	CO4	Identification of area or topic of students' interest to critically understand theory and practices of conservation.		
	2.5	Apply	CO4	Selection of a historic settlement, which will satisfy all the parameters in order to document, observe, analyse and redefine the heritage area.		
3. Workshop/ Fieldwork	3.1	Analyse	CO3	Selection of a historic settlement that will satisfy all the parameters in order to document, observe, analyse and redefine the heritage area.	Fieldwork/ Studio	90
	3.2	Analyse	CO1	Documentation of architectural elements to identify the construction techniques, material and its socio culture values.		
	3.3	Apply	CO5	Development of layers to the analyse traditional knowledge systems		
	3.4	Create	CO5	Critical analysis of identified layers to develop traditional knowledge systems		
	3.5	Evaluate	CO5	Rediscovery or Redefinition of historic settlement with critical evaluation in order to protect and preserve built heritage.		

#### Scheme of Evaluation

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Seminar/Assignment Review/Written Assignment Review/Time Problem	45	200	Review (Portfolio/ Digital Presentation/ Report*)	200
	1.2					
	1.3					
	1.4					
2. Studio	2.1	Seminar/Jury	90	350	Review (Portfolio/ Digital Presentation/ Report*)	350
	2.2					
	2.3					
	2.4					
	2.5					
3. Workshop/ Fieldwork	3.1	Seminar/Jury	90	200	Review (Portfolio/ Digital Presentation/ Report*)	200
	3.2					
	3.3					
	3.4					
	3.5					

\* Project Report is mandatory for the Semester End Examination

#### References

1. N. Thakur. 2011. Indian Cultural Landscapes: Religious pluralism, tolerance and ground reality. School of Planning and Architecture, Bhopal.; <https://architecturez.net/doc/az-cf-21175>
2. N. Thakur. 2002. The Architectural Knowledge Systems Approach. Architecturez Imprints.; <https://architecturez.net/doc/az-cf-21179>
3. Jokilehto, Jukka. 2018. A history of architectural conservation.
4. Rodwell, Dennis. 2007. Conservation and sustainability in historic cities. Chichester: John Wiley & Sons, Ltd.
5. Brown, Wayde. 2018. Reconstructing historic landmarks: fabrication, negotiation, and the past.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Capstone Project: Landscape**

**Course Code: 20BAR1013**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

The studio is run vertically between semester ten and semester eight. The studio pursues to unravel the inherent scope of landscape design approaches and intervention possibilities to mitigate challenges posed by diversified landscapes by in-depth research. The method seeks to sustainably resolve and design the way forward for such spaces to manage, conserve and transform them by addressing a range of site planning concepts, design methodologies, and landscape management techniques. The 10-semester students are expected to identify the environmental stressors in the broader context and come up with a research-based way forward theme to tackle the same—e.g., Understanding sea-level rise implications and climate change impacts in designing waterfront landscapes etc. Research-driven design proposals and detailed intervention that look into micro and macro scales are expected. The studio thus intends to focus on, the sensitive approach of unearthing the traits of the landscape and bridging the demands to address the concerns of the natural and cultural environment at the micro and macro scale.

No. of Teaching Hours					Scheme of Examination							
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation				
					CIE	SEE	Total Marks	Review		Written		
								Int.	Ext.	Marks	Duration of Exam	
Per week	3	6	6	15								
Per semester	45	90	90	225	750	750	1500	375	375	-	-	

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Understand</b>	CO1	Understanding the landscape site in relation to the larger context
<b>Apply</b>	CO2	In-depth documentation and critically addressing the different layers of landscape to understand its changing dynamics.
<b>Create</b>	CO3	Developing a strong research-based rationale to intervene and design considering the landscape in micro and macro scale.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	—	1	—	1	—	—	—	Unrelated
CO2	1	1	2	2	-	1	—	1	Indirectly Related
CO3	1	2	2	2	1	2	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1	The changing environmental stressors and landscape design solutions	<b>Self-Directed Study/ Research/ Lecture/ Studio</b>	45
	1.2	Remember	CO1	The key aspects relating to addressing different range of landscape sites.		
	1.3	Understand	CO1	Understanding ecological and sociological factors, from topology, hydrology, forestation, circulation and transportation, socio-cultural beliefs, and political and economic forces.		
2. Studio	2.1	Understand	CO2	Understand the changing dynamics of landscape site in relation to varying environmental stressors i.e., Climate change, urbanization etc.	<b>Research/ Studio</b>	90
	2.2	Analyse	CO2	Analyse the design proposals in their effectiveness to combat the stressors		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.3	Apply	CO3	Design considering the impact of stressors taking into account predictive future changes		
	2.4	Create	CO3	Policy level/planning interventions to address micro and macro context of landscape site		
3. Workshop/ Fieldwork	3.1	Apply	CO2	Study, analyse and document the site so as to understand the intricacies of the site and the context to decipher the issues of varying levels of complexities	Fieldwork/ Workshop	90
	3.2	Analyse	CO3	Directed towards inducing research-oriented approaches to conduct an intensive study on different issues pertaining to the landscape.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment Review/Written Assignment Review	45	100	Review (Portfolio/ Digital Presentation/ Report*)	100
	1.2					
	1.3					
2. Studio	2.1	Jury/Assignment Review/Time problem	90	500	Review (Portfolio/ Digital Presentation/ Report*)	500
	2.2					
	2.3					
	2.4					
3. Workshop/ Fieldwork	3.1	Jury/ Written Assignment Review*	90	150	Review (Portfolio/ Digital Presentation/ Report*)	150
	3.2					

\* Project Report is mandatory for the Semester End Examination

**References**

1. Shaheer, Mohammad, Geeta Wahi Dua, and Adit Pal. 2013. Landscape Architecture in India: A Reader. New Delhi: Landscape.
2. Gadgil, Madhav, and Ramachandra Guha. 2014. This Fissured Land: An Ecological History of India. New Delhi: Oxford University Press.
3. Waldheim, Charles. 2016. Landscape as urbanism: a general theory. Princeton: Princeton university press.
4. Weilacher, Udo. 1999. Between landscape architecture and land art. Basel: Birkhäuser.
5. Tufte, Edward R. 2011. Envisioning information. Cheshire, Conn: Graphics Press.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Capstone Project: Sustainability**

**Course Code: 20BAR1014**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	None

**Course Description**

Environment and development are intertwined and therefore must be systematically integrated in design process to produce environmentally friendly designs, thus achieve sustainable development. Staying ahead of the curve, this course aims at integrating sustainable development practices in students design training. Students will be able to evaluate their building designs using the simulation tools. Having the understanding of the building performance, they will also be able to suggest appropriate changes to make it energy efficient, carbon efficient and zero water building. Furthermore, this course will help them understand the three most important parameters in the building which are thermal comfort, visual comfort and building economics.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	3	6	6	15	750	750	1500	375	375	-	-
Per semester	45	90	90	225							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Create</b>	<b>CO1</b>	Apply the fundamentals of passive design/climatology right at the conceptual design stage to formulate the building envelope (like generate building form, defining Aspect Ratio, defining Orientation, and defining Window to Wall Ratio) and choosing sustainable materials.
<b>Apply</b>	<b>CO2</b>	Create building designs so as to achieve optimization of site potential; optimization of energy use; optimize building spaces and material use.
<b>Create</b>	<b>CO3</b>	Analyse the building design within a total project context in order to achieve quality, high-energy performance up to nearly zero energy buildings (nZEBs). Quantify the performance of the building for its energy and daylight along with integrating the renewable energy.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	-	1	2	2	1	1	2	—	Unrelated
CO2	-	1	2	2	2	1	2	1	Indirectly Related
CO3	1	1	2	2	2	2	2	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO 1	Understand the impact of the architectural design on the energy usage from micro to macro scale of the nation.	Class Exercise/ Self- Directed Study/ Workshop	45
	1.2	Analyse	CO 1	Understand how all the aspects of building design come together as one and how does it impact the occupants and their comfort.		
	1.3	Create	CO 2	Create the designs which are responding to the sun path and the local context of the place.		
2. Studio	2.1	Apply	CO 1	apply the basics of passive solar to generate the building form, orientation, aspect ratio etc	Research/ Studio	90
	2.2	Create	CO 2	create building wall/roof section based on the informed decision. Generate design by understanding thermal properties of the materials.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	2.3	Create	CO 2	design appropriate shading so as to protect the building from direct solar gains and to cut the glare		
	2.4	Communicate	CO 1	Establish the design intent even before the beginning of the conceptual stage		
	2.5	Create	CO 2	generate full building and site designs with understanding of the passive solar principles		
3. Workshop	3.1	Create	CO 3	create model geometry for thermal energy simulations. Also figure out the inputs required for the energy modelling	Self-Directed Study/ Research/ Workshop	90
	3.2	Evaluate	CO 3	analyse the results from the building thermal simulation		
	3.3	Communicate	CO 2	Communicate the quantified design to the respective stakeholder effectively- Note: This could be viva as well; the students could write a script before pitching their ideas to the stakeholders.		
	3.4	Evaluate	CO 3	Evaluate the overall building performance for the parameters like EUI (energy use intensity), CUI (carbon use intensity), daylight performance. Compare it against the benchmark building. Integrate it with renewable energy as well. -Note: this could be published to online platform. Also could be published in conferences.		

### Scheme of Evaluation

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment Review/Time Problem	45	150	Review (Portfolio/ Digital Presentation/ Report*)	150
	1.2					
	1.3					
2. Studio	2.1	Assignment Review/Time Problem/Jury	90	450	Review (Portfolio/ Digital Presentation/ Report*)	450
	2.2					
	2.3					
	2.4					
3. Workshop	3.1	Assignment Review /Jury	90	150	Review (Portfolio/ Digital Presentation/ Report*)	150
	3.2					
	3.3					
	3.4					

\* Project Report is mandatory for the Semester End Examination

### References

1. GBPN - Reports. Global Buildings Performance Network. (2019, January 1). <https://www.gbpn.org/reports>.
  2. Bureau of Energy Efficiency (BEE). 2017. Energy Conservation Building Code. New Delhi: BEE.
  3. Keeler, Marian, Marian Keeler, and Prasad Vaidya. 2016. Fundamentals of integrated design for sustainable building
  4. Brackney, Larry. 2018. Building energy modelling with Open Studio: a practical guide for students. Cham: Springer.
- Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Capstone Project: Urban Housing**

**Course Code: 20BAR1015**
**Credits: 15**

<b>Type of Course:</b>	<b>Professional Core Courses</b>
<b>Prerequisites:</b>	Housing Studio and Urban Studio

**Course Description**

The studio being a vertical studio with the students of the 8th semester, the students of the 10th semester, will have to generate a theme for the studio, which the entire studio will revolve around. The themes for the studio shall vary from climate-adaptive design to economics in the housing sector. However, these themes will be looked at from a very practical point of view based on the site selected, and the housing scenario then.

The studio addresses the various ideas of housing, such as affordable housing and traditional, cultural can be maintained and how to balance development at the suburban and urban with the needs of the neighbourhood development ideas. However, it will also interpret the complexities of providing, shelter for people from different socio-economic backgrounds close to each other, in a tightly kneed urban setting, by not just design proposals but also different identified housing models, and by various Housing design guidelines practices.

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	3	6	6	15							
Per semester	45	90	90	225	750	750	1500	375	375	-	-

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Create</b>	<b>CO1</b>	Deduce influences and demands for housing in India and ability to propose suitable design resolutions in the area of strategic housing development, and Interpret complexities of proving shelter for people from different socioeconomic backgrounds close to each other, in a tightly kneed urban setting.
<b>Analyse</b>	<b>CO2</b>	Understand and discuss major planning, policy, and design concerns relevant to housing design in India
<b>Evaluate</b>	<b>CO3</b>	Design strategies, and interventions using iterative design methods, and further communicate through the fundamental hopes of urban housing.
<b>Analyse</b>	<b>CO4</b>	Correlate multiple contextual factors with specific design decisions and multiple dimensions.
<b>Apply</b>	<b>CO5</b>	Analyse the values implicit in each of their proposals, stressing the connections between ideas and design, with the larger scales of the respective plans of the city, right from macro-level vision plans to miso level developmental plans.
<b>Create</b>	<b>CO6</b>	Planning housing strategies based on concerns raised in site, after analysis and produce various housing design guidelines based on the contextual parameters of the larger context.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:			
CO1	1	1	1	1	2	1	2	—	Unrelated		
CO2	2	2	1	1	2	1	2	1	Indirectly Related		
CO3	1	1	-	-	2	2	2	2	Directly Related		
CO4	1	1	-	-	2	-	2				
CO5	—	1	2	2	1	1	2				
CO6	1	1	1	2	1	2	2				

**Course Outline**

Module	UNIT	Domain/Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture	1.1	Understand	CO1, CO2	The lecture component of the studio shall be divided into three parts majorly, The first being as a prerequisite for analysing the site, the second part helping them frame the design program, and the third part helping the students introduce to policies and guidelines that will help in the housing sector of the city. • The student will gain in depth knowledge regarding developments in housing layout and patterns across place and time.	Class Exercise/ Self-Directed Study/ Lecture/ Studio	45
	1.2	Analyse	CO1	• Impact of mass housing on the existing urban environment and life of people.		
	1.3	Apply	CO2	• Housing policies and guidelines across the globe to understand the various techniques to tackle housing issues in the city.		
2. Studio	2.1	Evaluate	CO2	To analyse, and document relation between Housing and the city, and Impact of urbanisation on Housing.	Research/ Fieldwork/ Studio	90
	2.2	Communicate	CO4	Initial Site documentation, and detail analysis with respect to various tangible and intangible filters.		
	2.3	Apply	CO3	Proposing strategies and interventions with respect to different scopes of sites chosen within the areas of development and its' contextual proximity.		
	2.4	Evaluate	CO5, CO6	Explore different urban housing parameters for further explorations in terms of design concepts and provide Developmental Guidelines for the housing sector, as a part of the masterplan exercise.		
3. Workshop/ Fieldwork	3.1	Analyse	CO2, CO3	The stage one of the workshop component of the studio will have the site visit in it, where, for a certain period of time, the students shall stay in site and complete the basic works of documenting the same.	Research/ Fieldwork	90
	3.2	Apply	CO6	The stage two of the workshop component of the studio can further have a research workshop, where the students can take up various urban concerns and then conduct primary or even secondary research on the same.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture	1.1	Assignment Review/Written Assignment Review	45	100	Review (Portfolio/ Digital Presentation/ Report*)	100
	1.2					
	1.3					
2. Studio	2.1	Seminar/Jury/Time problem	90	500	Review (Portfolio/ Digital Presentation/ Report*)	500
	2.2					
	2.3					
	2.4					
3. Workshop/ Fieldwork	3.1	Seminar/Jury/ Written Assignment Review*	90	150	Review (Portfolio/ Digital Presentation/ Report*)	150
	3.2					

\* Project Report is mandatory for the Semester End Examination

**References**

- Carmona, Matthew. 2013. Housing design quality: through policy, guidance and review. London: Routledge.
- Franklin, Bridget. 2006. Housing transformations: shaping the space of twenty-first century living. London: Routledge.
- Biddulph, Mike. 2016. Introduction to residential layout.
- Habraken, John. 1972. Supports: an alternative to mass housing. London: The Architectural Press.
- Turner, John F. C. 1982. Housing by people: towards autonomy in building environments. London: Marion Boyars.
- Turner, John F.C., and Robert Fichter. 1972. Freedom to build dweller control of the housing process. New York:

Macmillan.

7. Valeur, Henrik. 2014. India: the urban transition: a case study of development urbanism. Copenhagen: The Architectural Publisher B.
8. Correa, Charles. 2000. Housing and urbanisation. London: Thames & Hudson
9. Whyte, William Hollingsworth. 2014. The social life of small urban spaces. New York: Project for Public Spaces.
10. Dobbins. 2009. Urban design and people. Hoboken (New Jersey): John Wiley & Sons.
11. Gehl, Jan, and Birgitte Svarre. 2013. How to Study Public Life. Washington, DC: Island Press/Centre for Resource Economics
12. Rapoport, Amos. 1989. House form and culture. Englewood Cliffs: Prentice-Hall.
13. Habraken, Type as a Social Agreement
14. Towers, Graham. 2015. An introduction to urban housing design: at home in the city. New York: Routledge.

Note: The references provided above are suggestive only. The course faculty may recommend alternatives in the course plan and get it approved by the Director. Latest editions of the references mentioned above may be referred to.

**Semester 10**  
**Professional Practice**

Course Code: 20BAR105

Credits: 3

<b>Type of Course:</b>	<b>Professional Ability Enhancement Courses</b>
<b>Prerequisites:</b>	-

**COURSE DESCRIPTION**

Professional leadership role of the architect to manage a consultancy practice adhering to building statutes and code of conduct of professional bodies, facilitating between various stakeholders of the design and construction industry,

No. of Teaching Hours					Scheme of Examination						
Hours	Lecture	Design Studio/ Construction Studio/ Project/ Thesis	Lab/ Workshop/ Studio Exercise/ Seminar	Total	Marks			SEE Evaluation			
					CIE	SEE	Total Marks	Review		Written	
								Int.	Ext.	Marks	Duration of Exam
Per week	3	-	-	3	150	150	300	50	50	50	2 Hours
Per semester	45	-	-	45							

**Course Outcomes**

Domain/ Level	Outcomes	
<b>Remember</b>	<b>CO1</b>	Identify and discover the role of professional and statutory bodies, the code of conduct, and most importantly the role of an architect in project execution.
<b>Analyse</b>	<b>CO2</b>	Identify the structured methods of project execution and the right of way of exercising the rights as a professional.
<b>Understand</b>	<b>CO3</b>	Build professional capacity to make well-informed decisions on site. Further, identify if the decisions are in tandem with the national and or local guidelines and norms.

**Course Outcomes – Program Outcomes Mapping**

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	Levels of Relation:	
CO1	2	2	1	1	2	—	1	—	Unrelated
CO2	2	2	1	1	2	—	2	1	Indirectly Related
CO3	2	2	2	2	—	—	-	2	Directly Related

**Course Outline**

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
1. Lecture/ Seminar	1.1	Apply	CO1, CO2 & CO3	<b>Architect and Society:</b> Idea of profession and essential difference among profession, trade and business. It's essential tenets, duties and liabilities. Role of Council of Architecture and the Indian Institute of Architects in the functioning of the Profession.	Class exercise/ Self-directed study/ Lecture/ Seminar	45
	1.2	Apply	CO1, CO2 & CO3	<b>Profession of Architecture:</b> Types and extent of services offered by architects, scale of fees, stages of payment, and contract between client and architect. Types of Architectural firms, Basic accounting procedures. Legalities and formalities in profession. Various means of building client base and gaining projects. Architectural competitions, drawing preparations and management.		

Module	UNIT	Domain/ Level	CO Mapping	Topic Outline	Method of delivery	Hours
	1.3	Apply	CO1, CO2 & CO3	<b>Building Industry:</b> General overview of the industry. Various participants and dimensions of building industry. Enforcement issues related to building industry and the role of architect, employer, and contractor, Contract management with a focus on Architect's role. Tenders, Contracts and site management.		
	1.4	Apply	CO1, CO2 & CO3	<b>Land as an asset:</b> Land Holdings, Valuation, Easements, Dilapidations and role of an architect as an Arbitrator		
	1.5	Apply	CO1, CO2 & CO3	<b>Step Ahead: Practice and employment opportunities:</b> Discuss the possible current opportunities for fresh young budding Architect: self-employed, salaried employee, journalist, NGO's etc		
	1.6	Apply	CO1, CO2 & CO3	<b>The New approach:</b> Introduction to possible new opportunities that can be collaborated with the profession: Event management, Advertising, Branding, Product development and come up with an action plan for the future.		

**Scheme of Evaluation**

Module	UNIT	CIE			SEE	
		Method of Evaluation	Hours	Marks	Method of Evaluation	Marks
1. Lecture/ Seminar	1.1	Written test/ Seminar/ Quiz/ Assignment review/ Written assignment review	45	150*	Written Exam	50
	1.2					
	1.3					
	1.4					
	1.5				Review (Portfolio/ Digital Presentation/ Report)	100
	1.6					

\* For modules with Written Exam as the method of evaluation in the Semester End Examination, Written Tests should be mandatorily included as part of the CIE with at least 50 marks of the total CIE.

**References**

- Krishnamurthy, K. G., and S. V. Ravindra. 2014. Professional Practice. Delhi: PHI Learning.
- Namavati, Dr Roshan H. Professional Practice: With Elements of Estimating, Valuation, Contract and Arbitration. First Edition. Lakhani Book Depot, 2016.
- Greenstreet, Bob, David Chappell, Michael Dunn, and Karen Greenstreet. 2003. Legal and contractual procedures for architects. Oxford, UK: Architectural Press.
- Freeth, Evelyn, and Peter Davey. 1979. AJ Legal Handbook. London: Architectural Press.

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